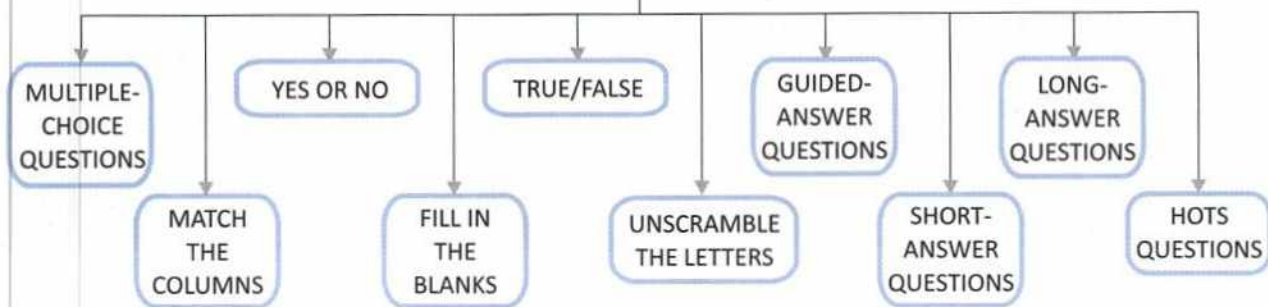
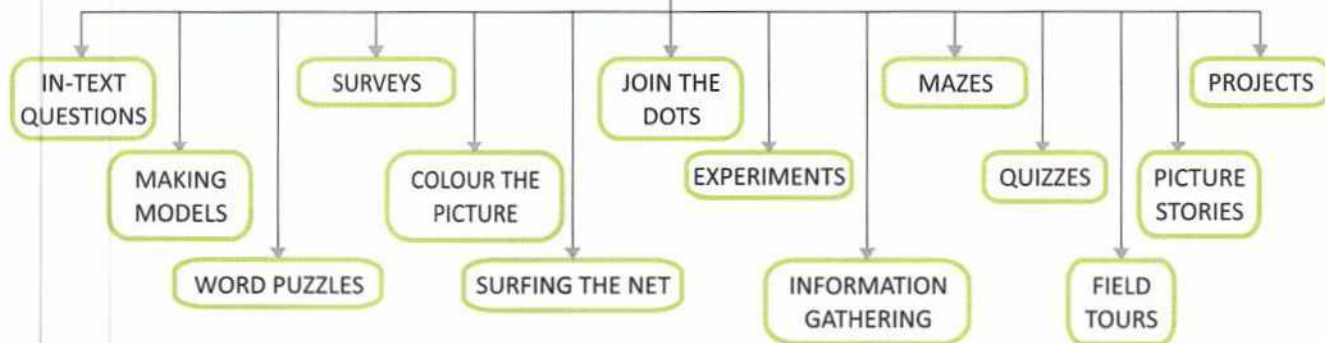


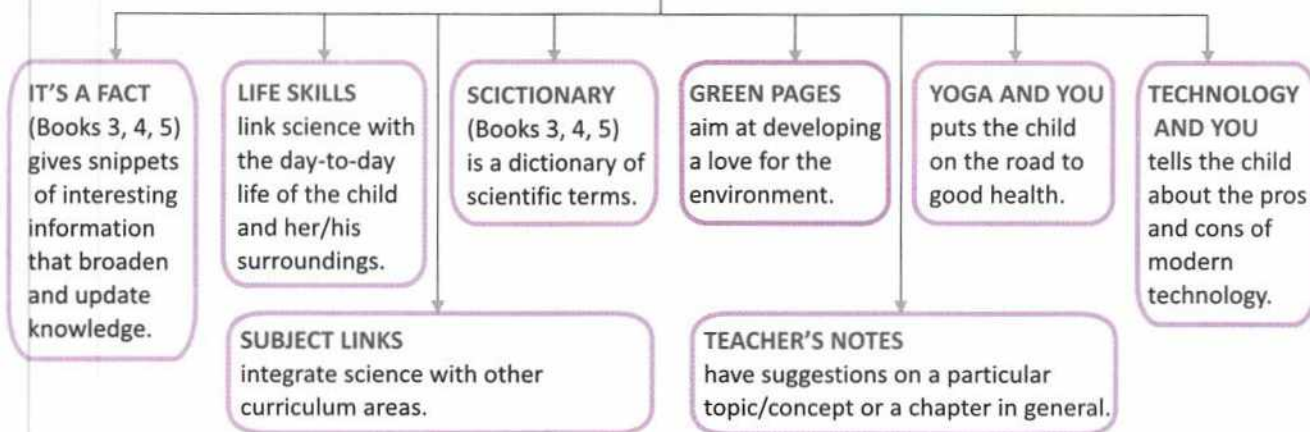
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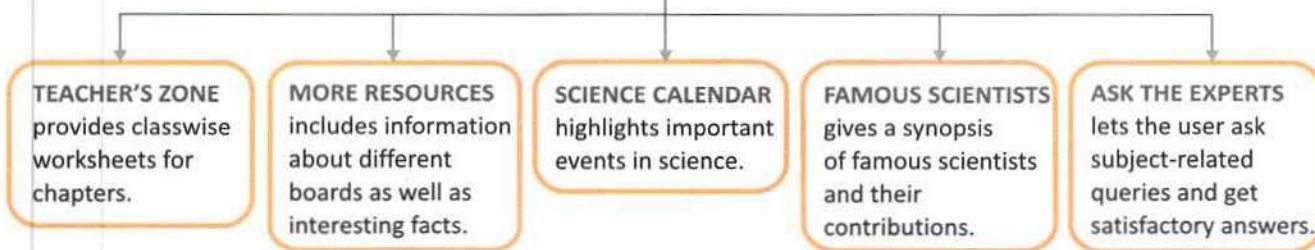
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THERE'S MORE . . .



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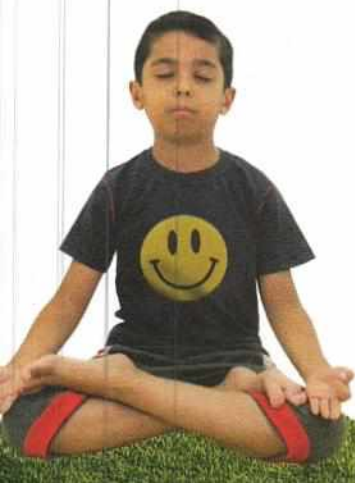
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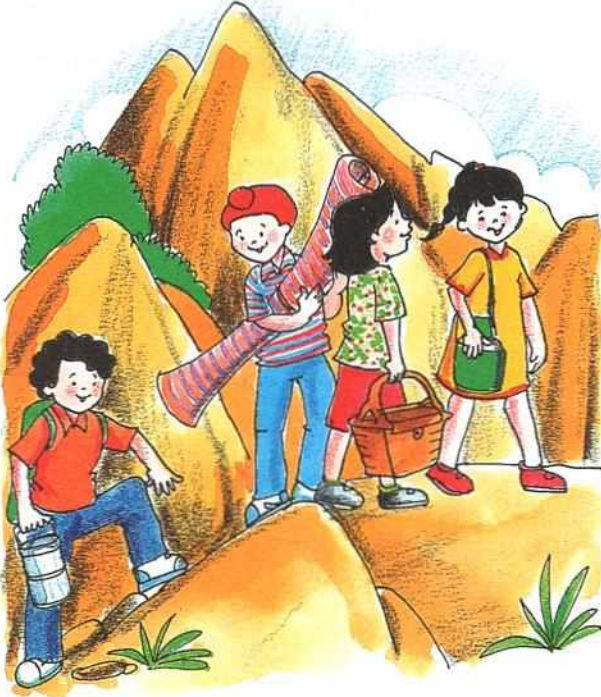
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An Environment Story

This is the story of four friends and how they form a nature club.
Read the story carefully and answer the questions at the end.

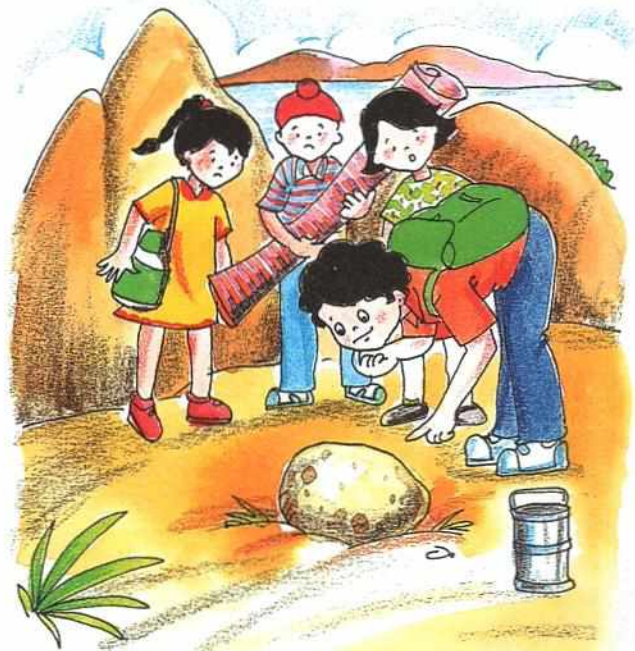


Deepa, Mary, Hasan and Harjeet were four friends. One Sunday, they were going to Barren Rock for a picnic. Suddenly Hasan stumbled and fell. "Are you hurt?" asked Deepa. "No, I am all right," said Hasan. Harjeet piped up, "Let's sit down for a while."

Hasan looked at the rock over which he had tripped. "Look! What a smooth and round rock. Let's dig it out."

The four friends started digging the rock out. "Wow!" said Deepa. "It looks like a huge egg."

"This might be the egg of a dinosaur, you know," said Mary. She had read a book about the 'Tyrannosaurus Rex' the previous night. "I'll take it home," she said.



Later in her room at night, Mary kept the egg on her bedside table. Suddenly she heard a crackling sound. A tiny dinosaur peeped out from the egg.

"Thank you, Mary, for bringing me home," the dinosaur said. "Do you know there are no more dinosaurs on earth? We have become extinct. Like us, many other animals are becoming extinct.



Animals are killed for their skins, horns, bones, and meat. When forests are cut down, the animals living in them die. More and more animal species are disappearing every day. Many animals like the giant panda and the musk deer are in great danger today.

Save them, Mary," it cried.

Mary hugged the dinosaur and said, "I promise I will." Then suddenly she woke up and found herself hugging a pillow!

She told her friends about her dream. They decided to form a nature club and call it the 'Save the Animals' Club. They asked their other friends too to join it.

Discuss with your partner.

1. Why are animals killed by humans?
2. Why did the four friends form a club?

Food and Digestion

AIMS

- To enable the student to
- know the various nutrients present in food and to know their functions.
 - understand how digestion takes place in the human body.
 - learn and practise proper food habits.
 - appreciate the need to cook food and to preserve it.

AIDS

- a chart showing some food nutrients
- a chart or a model of the human digestive system
- samples of preserved food

All living things need food. Food helps us to grow and to stay alive. It gives us energy to work and keeps us fit and healthy.

We eat wheat, rice, vegetables, fruits and pulses. Some of us also eat meat, fish and eggs.

Food contains substances called

nutrients which provide nourishment to the body.

NUTRIENTS IN FOOD

Food contains nutrients like **proteins, carbohydrates, fats, vitamins and minerals**. Food also contains **roughage and water**.



Fig. 1.1 Food gives us energy to do work.

NUTRIENTS (new-tree-ents) substances in food which keep us alive and healthy



Fig. 1.2 Foods rich in carbohydrates and fats give us energy.



Fig. 1.3 Foods rich in proteins help us to grow.



Fig. 1.4 Foods rich in vitamins and minerals keep us fit and healthy.

What do nutrients do for us?

Carbohydrates give us energy to work. People who do more physical work need more carbohydrates. **Sugar** and **starch** are two types of carbohydrates. Rice, wheat and potato contain starch.

Fats give us more energy than starch or sugar. Oil, nuts and butter contain fat. Fats help to keep our body warm. Extra fat is stored in the body for future use. However, we must not have too much fat. Foods that are rich in carbohydrates and fats are called **energy-giving foods**.

Proteins help us to grow. This is why children need more protein. Eggs, fish,

meat, cheese, peas and pulses contain proteins. Foods that are rich in proteins are called **body-building foods**.

Vitamins help our body to fight diseases. We must regularly have foods which contain vitamins though our body needs a very small quantity of them.

Minerals help in the formation of bones, teeth and blood. Calcium, potassium, sodium, iodine and iron are some examples of minerals. We get vitamins and minerals from fresh fruits, vegetables, meat, fish, liver and milk. Foods rich in vitamins and minerals keep us fit and healthy. They are called **protective foods**.

Roughage is the fibre present in our food. It is necessary for the proper functioning of the digestive system. It adds bulk to the food.

Water is essential for our body to function properly. Three-fourths of our body weight is water.

A balanced diet

A **balanced diet** has the right amounts of all the nutrients, that is, carbohydrates, fats, proteins, vitamins and minerals.

DIGESTION OF FOOD

The food that we eat is not directly used to provide energy. It is broken down into a simpler form. The process of breaking down of food into a simpler form is called **digestion**.

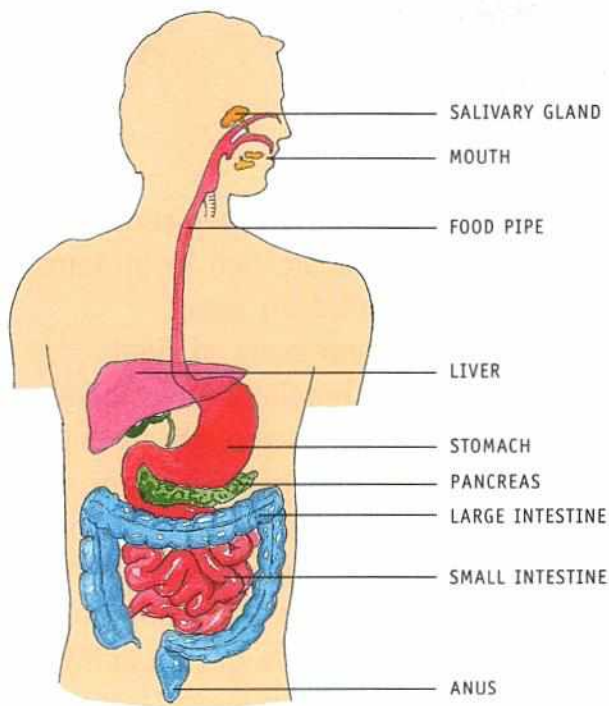


Fig. 1.5 Digestive system of man

IT'S A FACT!

If our intestines were not coiled but straight, we would have had to be nearly 33 feet tall!

Digested food is absorbed by the blood and taken to all the parts of the body.

The process of digestion

The process of digestion begins from the moment we put food into our mouth. Our teeth bite and chew the food and break it into small pieces. As we chew, the **saliva** in our mouth mixes with the food. Saliva is a digestive liquid secreted by the **salivary glands** (Fig. 1.5). Saliva changes the insoluble starch in food into soluble sugar. That is why starchy foods like bread and rice taste sweet after we chew them.

From the mouth the food passes through the **food pipe** into the **stomach**. Our stomach is a hollow, muscular bag. The food is churned here. The digestive juices in the stomach break down the proteins present in the food into a simpler form.

From the stomach, the food is pushed into a long coiled tube called the **small intestine**. The inside walls of the small intestine produce a juice that mixes with the food. The **liver** and the **pancreas** also pour their juices into the small intestine. These juices help to completely digest the food. The digested food is almost like a liquid. The blood vessels present in the walls of the small intestine absorb the digested food and carry it to all the parts of the body.

DIGESTION (die-je-shun) the process of breaking down of food into a simpler form

The undigested food passes into the **large intestine**. The blood vessels in the walls of the large intestine absorb the extra water. The semi-solid waste is passed out through the **anus** when we go to the toilet.

Some tips for proper digestion

- Have your food at fixed hours.
- Chew your food well before swallowing.
- Eat lots of green vegetables and fruits.
- Do not overeat.
- Drink plenty of water.



Fig. 1.6 Cooking makes food soft, tasty and easily digestible.

We should wash them properly before eating so as to free them from dust and germs. Other types of food are cooked before eating. Some foods, such as rice and potatoes are boiled. *Idlis* are steamed. *Puris* are fried. Potatoes, brinjals and meat are sometimes roasted. Cooking makes food soft, tasty and easily digestible. It also kills the germs in the food.

Oral Questions

Choose the correct answer.

1. Foods rich in carbohydrates and fats are energy-giving / body-building / protective foods.
2. Roughage is the fibre / fat / protein in our food.
3. Digested food is absorbed by the blood vessels of the small intestine / stomach / large intestine.

PREPARING FOOD

We eat raw as well as cooked food. Fruits and certain vegetables are eaten raw.

Things to remember while cooking

- Do not throw away the water in which pulses are soaked. It contains vitamins. Use it for cooking.

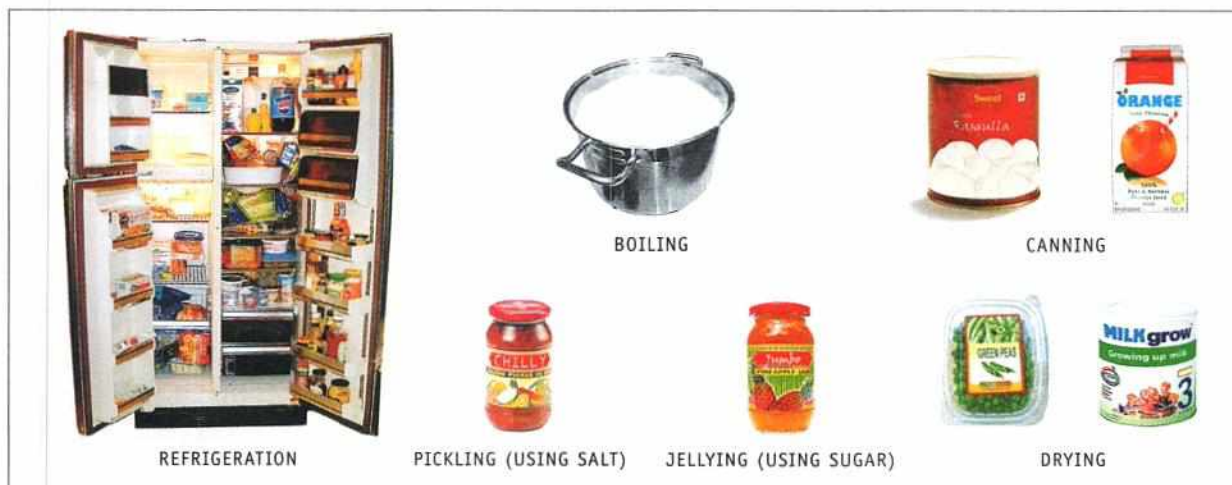


Fig. 1.7 Some methods of preserving food

- Do not wash vegetables and fruits after cutting them.
- While boiling, take just enough water so that the water which has absorbed the nutrients is not thrown away.
- Do not overcook. Too much roasting and frying destroys the nutrients.

PRESERVING FOOD

Food is valuable. If not preserved, it may begin to spoil. The process of treating food in a way that preserves its value for a long time is called **preservation**. Cooked or uncooked food can be preserved in different ways (Fig. 1.7).

Let us say it again

- Food helps us to grow, gives us energy and keeps us healthy.
- Carbohydrates and fats give us energy and keep us warm. Proteins help us to grow.
- Vitamins and minerals keep us fit and healthy.
- Digestion is the process of changing food into a simpler form that can be absorbed and used by the body.
- Digestive juices from our mouth, stomach and small intestine help us to digest our food.
- Cooking makes food soft, tasty and easily digestible.
- Cooked or uncooked food can be preserved in different ways.



Let us answer

A. Tick (✓) the correct answer.

- Eggs, fish, cheese, peas and pulses are called
 - energy-giving foods.
 - body-building foods.
 - protective foods.
- These are protective foods.
 - bread and butter
 - peas and pulses
 - fruits and vegetables
- Calcium, potassium, sodium, iodine and iron are examples of
 - vitamins.
 - minerals.
 - carbohydrates.
- From the mouth the food passes through the food pipe into the
 - small intestine.
 - large intestine.
 - stomach.
- Do not wash vegetables and fruits
 - before eating them.
 - after cutting them.
 - ever.

B. Complete this table of nutrients.

NAME OF THE NUTRIENT	SOURCES	FUNCTION/FUNCTIONS
proteins	pulses, meat, cheese, peas, eggs, fish	help us to grow

C. Match the columns.

- | | |
|---|--------------------------|
| 1. body-building nutrients | a. saliva |
| 2. protective nutrients | b. stomach |
| 3. changing of food into a simpler form | c. preservation |
| 4. the digestive liquid in the mouth | d. proteins |
| 5. the muscular bag in the digestive system | e. digestion |
| 6. makes food last longer | f. vitamins and minerals |



D. Write short answers.

1. Why do we need food?
2. Name any three food items which contain starch.
3. Name any four sources of vitamins and minerals.
4. What is a balanced diet?
5. Where does the digested food enter from the stomach?

E. Answer these questions.

1. What happens to the food in the mouth?
2. What is the function of the small intestine?
3. What happens to our food when it enters the stomach till it reaches the large intestine?
4. What is preservation?
5. How do we preserve food?



HOTS questions

F. Think and answer.

1. You need to consume more proteins than your grandmother. Why?
2. Pineapple jam can be kept for a longer period than pieces of pineapple. Why?
3. Your father brings milk every morning. Why can't he get milk for the whole month together?



Let us do



ENRICHMENT ACTIVITIES

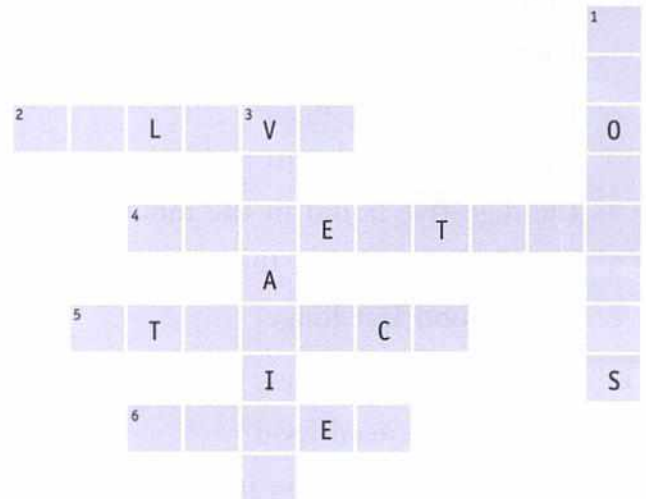
G. Solve the crossword puzzle with the help of the clues given below.

ACROSS

- 2 This helps to digest starch in the mouth.
- 4 This part of your digestive system may be large or small.
- 5 The name of muscular bag in the digestive system.
- 6 Minerals help in the growth of teeth and _____

DOWN

- 1 These help in the growth and repair of the body.
- 3 These nutrients protect us against diseases.



H. Let us make charts. It is fun to work together.

Divide the class into four teams.

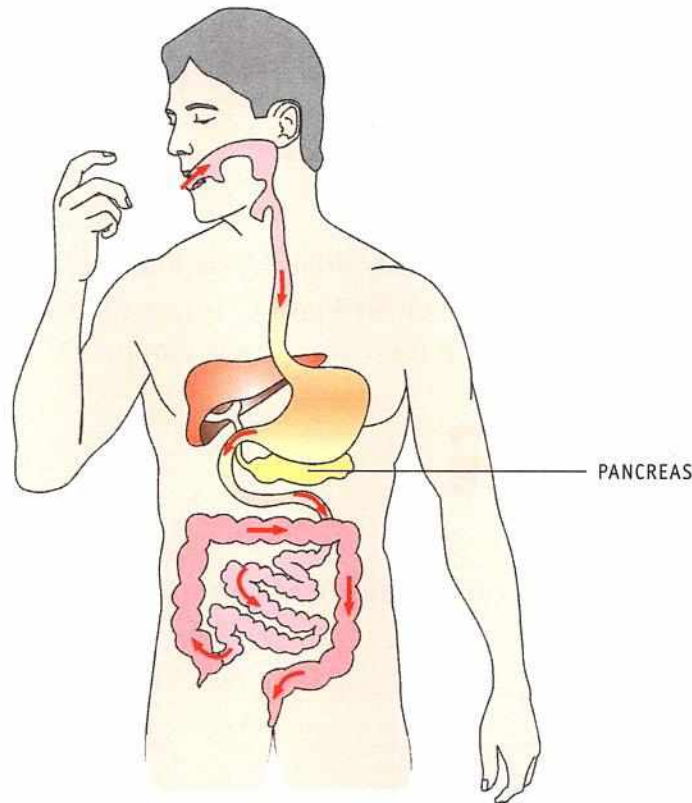
- TEAM 1 makes a chart on the digestive system.
- TEAM 2 collects samples of energy-giving foods and makes a chart.
- TEAM 3 collects samples of foods that help us to grow and makes a chart.
- TEAM 4 collects samples of foods that help us to stay healthy and makes a chart.

Put up the charts on your class bulletin board.



I. The following is a diagram of the digestive system of humans. Label it with words from the box. One is done for you.

pancreas small intestine liver stomach
mouth large intestine food pipe



J. Here is how you can make some tasty and nutritious yogurt.

- ❖ Take two cups of yogurt in a bowl.
 - ❖ Beat it well with a whipper or fork.
 - ❖ Add to it chopped pieces of apples, pineapples, cucumber and tomato. You can also use fruits like grapes, oranges or pomegranate seeds.
 - ❖ Add a pinch each of salt and pepper. Mix well.
- Your yummy yogurt is ready.



K. Visit a food manufacturing factory.

TO VISIT

Visit a food manufacturing factory in your town. Watch how food is preserved there. Also, note if the factory is causing harm to the environment in any manner. Write your observations in your notebook.

A life skill



L. Learn to have a balanced meal.



PLATE A

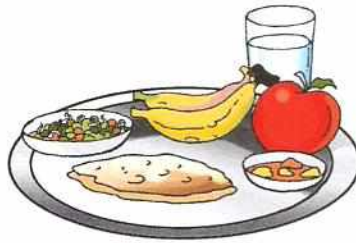


PLATE B

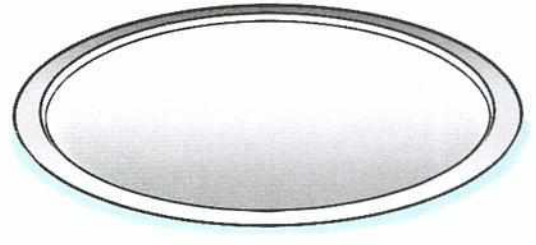


PLATE C

Which one is a healthy breakfast—Plate A or Plate B?

Serve yourself a balanced lunch in Plate C (draw food items and colour them).

There should be at least one food from each group.

A subject link



(SOCIAL STUDIES)

M. Unscramble the names of these dishes prepared on festivals. Match them to the festivals.

1. AKEC _____
2. HIJYUGA _____
3. NIWASE _____
4. ESETW CIRE _____

HOLI
PONGAL
EID
CHRISTMAS

TEACHER'S NOTES: A model of the digestive system in front of the class makes it easy to understand the path of the food. Encourage children to bring balanced food in their lunch box. If the teaching is effective children will start showing improvement in food habits.

Teeth and Microbes

AIMS

- To enable the student to
- know the importance of teeth.
 - recognize the different kinds of teeth and know the parts of a tooth.
 - learn to take proper care of teeth.
 - identify and name some useful and some harmful microbes.

AIDS

- 🌐 a set of dentures
- 🌐 pictures of various kinds of teeth
- 🌐 slides of bacteria, viruses, protozoa, fungi
- 🌐 a dentist invited to talk to the children

When a photographer asks us to say 'cheese', he actually wants us to smile. Clean and well-kept teeth make our smile beautiful. They give proper shape to our face. Teeth help us to speak clearly. They enable us to bite and chew food. This makes digestion easy. So, our teeth are a very important part of our body.

TWO SETS OF TEETH

A newborn baby has no teeth. She cuts her first tooth when she is about six months old. By the time she is two-and-a-half years old, she has twenty teeth. These are called **milk teeth** or **temporary teeth**.

Between the ages of six and twelve, the milk teeth fall out one by one and new ones grow in their place. This new set consists of 32 teeth, 16 in the

upper jaw and 16 in the lower jaw. These are called **permanent teeth**.

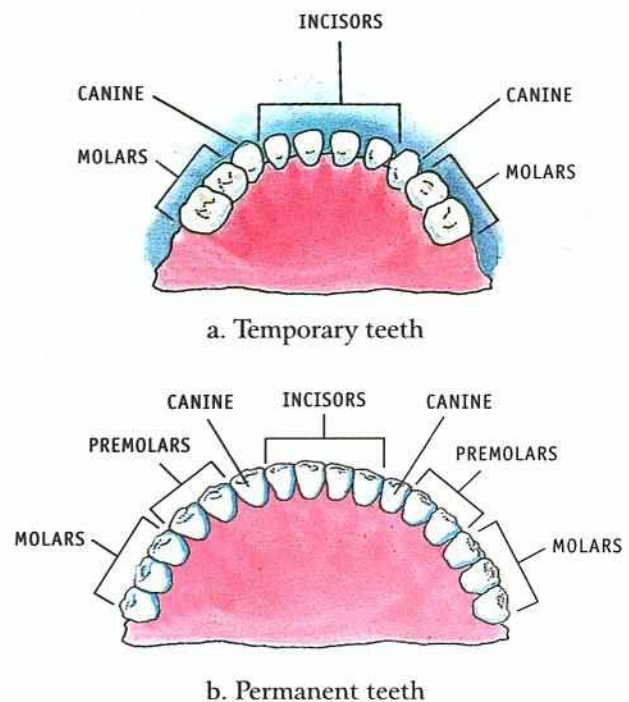


Fig. 2.1 Two sets of teeth

KINDS OF TEETH

Figure 2.2 shows the four kinds of teeth in a permanent set.

Incisors or cutting teeth

The four chisel-shaped teeth at the front of each jaw are incisors. We use them to bite our food.

Canines or tearing teeth

On either side of the cutting teeth is a sharp tooth. These are canines which we use to tear pieces of food.

Premolars or cracking teeth

There are four premolars in each jaw. These are the broad teeth next to the canines. They act like nutcrackers. They are meant for crushing food.

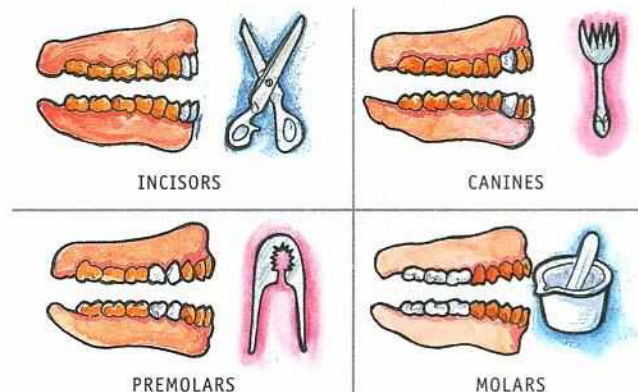


Fig. 2.2 Kinds of teeth

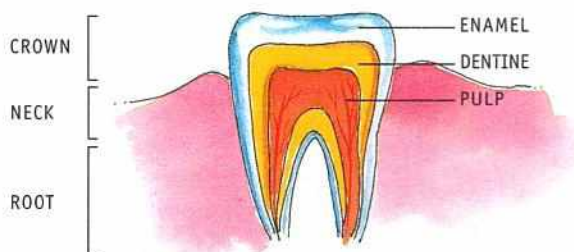


Fig. 2.3 Structure of a tooth

Molars or grinding teeth

There are six molars in each jaw. They are broader than the premolars and have broad upper surfaces to grind food.

THE STRUCTURE OF A TOOTH

A tooth has three parts: the crown, the neck and the root (Fig. 2.3).

The outer cover of a tooth is very hard. It is called **enamel**. Enamel is the hardest substance in our body. Below it lies the **dentine**. This is also quite hard. Inside the dentine is the **pulp**. This is soft and has blood vessels and nerves. The nerves are connected to the gum through a hole in the root (Fig. 2.3).

CARE OF TEETH

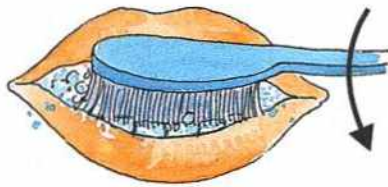
If we take good care of our teeth, we can save them from **decaying**. Bits of food that remain stuck to the teeth can cause the growth of bacteria. **Bacteria** first attack the enamel and form a sticky coating called **plaque**. Then they attack the dentine and finally the pulp. When the bacteria reach the nerves within the pulp, they cause pain. Tooth decay results in bad breath, cavities, toothache, bleeding gums and indigestion.

Calcium and vitamin C are important for healthy teeth and gums. Foods like milk, cheese and cottage cheese are rich sources of calcium.

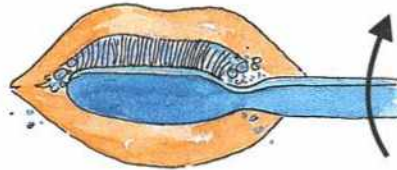
THINK GREEN!

Eating salads and fruits gives a lot of exercise to our gums and improves the flow of blood inside them.

DECAYING here, germs infecting and weakening a tooth
BACTERIA (back-tea-ria) tiny single-celled microorganisms



MOVE THE BRUSH DOWNWARDS



MOVE THE BRUSH UPWARDS

Fig. 2.4 Regular brushing of teeth prevents tooth decay.

Tips for keeping teeth healthy

- 🦷 Brush your teeth every morning and every night before going to bed. Make sure that you move your brush both upwards and downwards (Fig. 2.4).
- 🦷 Use a dental floss to clean between two teeth.
- 🦷 Wash your mouth after every meal.
- 🦷 Do not have too many sweets or colas.
- 🦷 Visit your dentist regularly for checkups.

Oral Questions

Choose the correct answer.

1. A newborn baby has twenty teeth / no teeth / two teeth.
2. There are four / five / six molars in each jaw.
3. The outer layer of a tooth is called enamel / dentine / pulp.
4. Dentine / Enamel / Pulp is the hardest substance in our body.

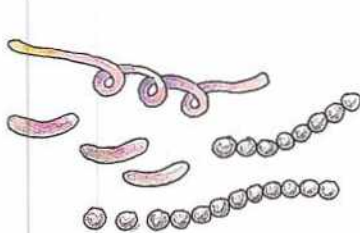
MICROBES

Microbes are tiny living things. They can be seen only through a microscope. Microbes are found everywhere. They grow rapidly wherever they get warmth, moisture, food and air. They may grow in soil, in water, inside or outside our body and in the bodies of other animals. Our mouth and blood provide favourable conditions for certain microbes. Some microbes cause diseases in human beings. Disease-causing microbes are called **germs**. However some microbes are useful.

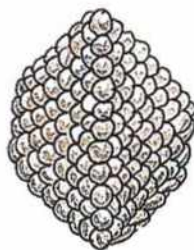
Kinds of microbes

There are four main kinds of microbes.

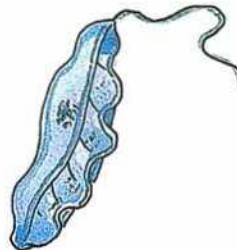
BACTERIA: Bacteria are single-celled microorganisms. They may be rod-shaped, spiral or round. Harmful bacteria can cause diseases like typhoid, tuberculosis and pneumonia.



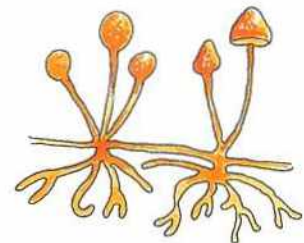
BACTERIA



VIRUSES



PROTOZOA



FUNGI

Fig. 2.5 Kinds of microbes

DENTAL FLOSS a silk thread used for cleaning between the teeth

VIRUSES: **Viruses** are smaller than bacteria and can be seen only through a powerful microscope. They cause diseases like chickenpox, flu, polio, dengue (say dayn-gee) and common cold.

PROTOZOA: **Protozoa** are single-celled microorganisms. Malaria and dysentery are caused by protozoa.

FUNGI: **Fungi** are organisms which grow on decaying matter and cause skin diseases like ringworm and athlete's foot. However, some fungi called yeast help to make bread soft.

Some microbes are useful

Some bacteria

- 💡 change milk into curd.
- 💡 produce vitamins in our body.
- 💡 help in the decaying of dead plants and animals.
- 💡 help in digestion of roughage in animals.

IT'S A FACT!

Microbes are the oldest form of life on earth. They outnumber all other species on earth and make up most living matter. Most microbes do not cause disease.

Let us say it again

- 💡 Good teeth a. make us look good, b. help us to speak clearly, and c. help us to chew.
- 💡 Humans have two sets of teeth—milk teeth and permanent teeth.
- 💡 A tooth has three parts—crown, neck and root.
- 💡 A tooth has three layers—enamel, dentine and pulp.
- 💡 Tooth decay results in bad breath, bleeding of gums and indigestion.
- 💡 Microbes are very small living things that can be seen only through a microscope.
- 💡 Some microbes are harmful as they cause diseases. Some microbes are useful.



Let us answer

A. Tick (✓) the correct answer.

1. The four chisel-shaped teeth at the front of each jaw are
a. canines. b. incisors. c. molars. d. premolars.
2. We use these teeth to tear pieces of food.
a. incisors b. canines c. molars d. premolars

VIRUS (vy-rus)	a very small microbe
PROTOZOA (pro-tow-zo-a)	tiny single-celled microorganisms
FUNGI (fun-gai)	microscopic plants that grow on decaying matter

3. Which of the following is used to clean between two teeth?
 - a. dental floss
 - b. toothbrush
 - c. toothpaste
 - d. nutcracker
4. The number of grinding teeth in each jaw is
 - a. three.
 - b. four.
 - c. five.
 - d. six.
5. Tooth decay causes
 - a. thirst.
 - b. bad breath.
 - c. hunger.
 - d. itching.

B. Fill in the blanks with the correct word from the brackets.

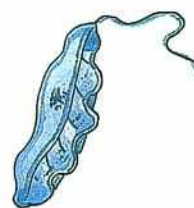
1. Eating too many _____ (sweets/ fruits) causes tooth decay.
2. Disease-causing microbes are called _____ (germs/ microorganisms).
3. Pneumonia and typhoid are caused by _____ (bacteria/ viruses).
4. _____ (Yeast/ Germs) are used to make bread soft.
5. Fungi grow on decaying matter and cause diseases like ringworm and _____ (athlete's foot/ chickenpox).

C. Write short answers.

1. Name different kinds of teeth.
2. Which are the three layers of a tooth?
3. Write four conditions that help microbes to grow.
4. Name four kinds of microbes.
5. Write any four diseases caused by microbes.

D. Answer these questions.

1. How are teeth important to us?
2. What are the functions of molars and premolars?
3. What type of foods are good for our teeth?
4. Write two tips which help to keep your teeth healthy.
5. What are microbes? Name two diseases caused by protozoa.
6. How are some microbes useful for us?



HOTS questions

E. Think and answer.

1. You must rinse your mouth well after meals. Why?
2. You must avoid having too many sweets. Why?
3. You must wash your hands before you eat anything. Why?

4. Who am I? Write my name. Draw me and label my parts.

I have a crown, I am not a king.

I have a neck, I am not an animal.

I have a root, I am not a plant.

I am a _____



Let us do



ENRICHMENT ACTIVITIES

F. Let us make posters.

Divide the class into two teams.

TEAM 1 prepares a poster on 'care of teeth'.

TEAM 2 prepares a poster on the materials used to clean teeth nowadays.

Display the posters in your school as a class project.

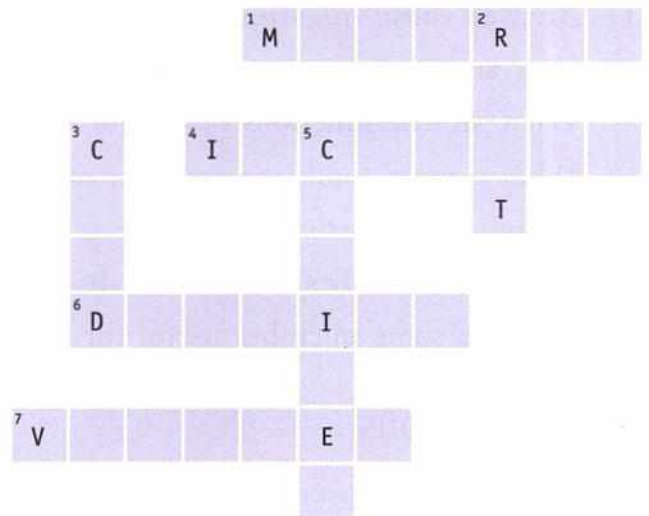
G. Solve the crossword puzzle with the help of the clues given below.

ACROSS

- 1 This is a disease caused by protozoa.
- 4 We need these teeth to bite food.
- 6 This lies below the enamel.
- 7 They cause disease like flu and common cold.

DOWN

- 2 It is a part of the tooth found below the neck of a tooth.
- 3 Some bacteria help to change milk into this.
- 5 These are also called tearing teeth.



H. Know how to brush properly.

Visit rsgr.in/lsc-4 and click on LINK 1 to know the steps and tips to brush your teeth properly.

A life skill



I. Take good care of your teeth.

Your teacher will invite a 'dentist' to come and speak to your class. He/She will tell you about some common dental problems in children. He/She will also tell you how to prevent them. Discuss with your partner and tick (✓) the questions you would like to ask.

1. Can I use any toothpaste?
2. How can chocolates spoil my teeth?
3. Will it be all right if I brush my teeth every time I eat sweets?
4. Can I use the floss myself?
5. Why is it important to clean the tongue?
6. How can germs enter my closed mouth?
7. Can we brush only in the morning?
8. Why do I have a 'hole' in one tooth?
9. How are 'cavities' formed on our teeth?



TEACHER'S NOTES: The importance of clean teeth has to be emphasized. Show a set of dentures to point out the different kinds of teeth and their functions. Show some permanent slides of microbes under a microscope.

Safety First

AIMS

To enable the student to

- understand how accidents happen.
- know how accidents can be avoided.
- deal with emergencies at home, at school and on the road.

AIDS

- sterilized cotton and bandages
- antiseptic cream and lotion
- scissors and band-aid
- some common medicines

Newspapers carry news of accidents almost everyday. Accidents cause harm to life and



Fig. 3.1 Do not leave your toys lying on the floor.

property. They cause pain and suffering. Accidents can be avoided if we follow **safety rules** at home, at school, on the playground and on the road.

Injuries at home are mostly caused by **slipping on the floor, burns, electric shocks and chemical poisoning.**

Make your home a safe place. Being aware and alert will go a long way in keeping you safe.

SAFETY AT HOME

Slipping on the floor

A person can slip and fall on a wet floor, trip over scattered toys or stumble down the stairs. To avoid such accidents

- keep the floors at home clean and dry. Take care that the bathroom and the kitchen floors are not slippery.
- do not leave your toys and other things lying on the floor.
- use a step ladder or a stool to reach something placed high.

Burns

Accidents due to a fire in the kitchen can cause serious injury (or even death).

To avoid such accidents

- one must not wear synthetic clothes in the kitchen. Such clothes catch fire easily.
- gas stoves when not in use must be turned off. They must be checked regularly to avoid leakage.

Electric shocks

Electrical appliances make our work easy. They should be handled carefully.

- Do not touch electrical fittings with wet hands. You may get an electric shock.
- Do not go too close to table fans or heaters if they are on.
- If someone gets an electric shock or sees a spark, the main switch must be turned off immediately.

Poisoning

Accidental consumption of chemicals and medicines can cause poisoning.

- Poisonous chemicals should be properly labelled and kept away from eatables.
- Do not take a medicine without asking an adult.

SAFETY AT SCHOOL

In schools, accidents can happen when children run and push each other.

To avoid such accidents

- do not rush up or down the stairs. You may fall and hurt yourself and others.



Fig. 3.2 Do not get too close to a running table fan.



Fig. 3.3 Medicines should be kept away from children.



Fig. 3.4 Follow the rules of the game while playing.

- do not climb on desks and chairs or throw things around.

SAFETY ON THE PLAYGROUND AND IN THE SWIMMING POOL

- Follow the rules of the game while playing. Wait for your turn at rides.

ELECTRICAL APPLIANCES (e-lek-tri-kal ap-lie-an-sez) gadgets like toasters and irons which run on electricity



Fig. 3.5 Walk on the footpath.



Fig. 3.6 Cross the road only at the zebra crossing.



Fig. 3.7 First aid can prevent a permanent injury.

- Use a swimming tube for swimming if you are not an expert swimmer. Always swim in the presence of an adult.

SAFETY ON THE ROAD

Follow traffic rules for your own safety and the safety of others. Carelessness on the road can cause accidents. To avoid such accidents

- walk on the footpath.
- cross the road only at the zebra crossing. Look to your right, then to your left and then to your right again. Cross the road when the traffic stops.
- do not rush. Start out in time.

Oral Questions

Choose the correct answer.

1. Accident / Fainting / Insect bite causes harm to life and property.
2. Do not touch electrical appliances / toys / utensils with wet hands.
3. Keep chemicals away from eatables / elders / thieves.
4. Use a swimming tube for swimming / swinging / running.

FIRST AID

First aid is the medical help given to an injured or a sick person before proper medical aid arrives. Immediate first aid can save a person's life or prevent permanent injury. You must learn to give first aid. While giving first aid, be calm and make the injured or sick person comfortable. Make him lie down. Do not panic after an accident. Common emergencies that need first aid are **minor cuts, fainting, insect bites, snake bites and burns.**

For minor cuts

If someone gets a minor cut, first wash the cut with water. Then apply an antiseptic lotion over it. If there is bleeding from the cut, try to stop it by tying a bandage on the cut. Dirt and flies should not be allowed to sit on the wound as they may cause infection. Send for a doctor immediately.

If a person faints

If a person faints, make him lie down with his head at a level lower than the body. This helps the blood to reach his brain faster. Allow fresh air around the person. Loosen his clothes and sprinkle cold water on his forehead. Let the person rest quietly. Send for a doctor.

If bitten by an insect

Insect bites or stings are painful. If bitten by an insect like a bee or a wasp, apply a

paste of baking soda and cold cream on the affected part to give relief. Put some ice on the affected part.

For burns





If a burn is minor, wash the burnt area with cold running water. Put an ice pack on the burnt area. Then apply an antiseptic cream on the affected area.

It is good to be prepared for an emergency and to know how to give first aid. However, it is better to remember and follow safety rules to avoid accidents. Always remember, 'Prevention is better than cure'.

THINK GREEN!

For an insect bite apply lemon juice or pieces of grated lemon to the affected area. A clay or mud paste can also be used to draw out the poison (venom), specially if the sting is on the hand. A slice of cucumber is effective for an ant bite.

Let us say it again

-  Accidents cause harm to life and damage to property. They also cause pain and suffering.
-  Follow safety rules to avoid accidents.
-  Some common accidents at home include slipping on the floor, burns, electric shocks and poisoning.
-  Bleeding wounds, fainting, insect bites, snake bites and burns are a few emergencies that need first aid.

Let us answer

A. Tick (✓) the correct answer.

1. To avoid tripping over scattered toys,
 - a. do not leave your toys lying on the floor.

- b. leave your toys lying on the floor.
 - c. leave your toys inside the kitchen.
2. One must not wear these clothes in the kitchen.
 - a. cotton
 - b. synthetic
 - c. woollen
 3. Stay away from
 - a. table fans.
 - b. rides.
 - c. toys.
 4. Apply a paste of baking soda and cold cream on the affected part, if
 - a. bitten by an insect.
 - b. a bone is broken.
 - c. someone gets a cut.
 5. To reach for something placed high, use a
 - a. rope.
 - b. ladder.
 - c. stick.

B. Match the columns to make complete sentences.

- | | |
|--------------------------|--|
| 1. Floors | a. apply an antiseptic cream on the affected area. |
| 2. Electrical appliances | b. must be kept dry to prevent slipping on them. |
| 3. Use a swimming tube | c. should be handled carefully. |
| 4. An antiseptic lotion | d. if you are not an expert swimmer. |
| 5. For burns | e. must be used to clean cuts. |

C. Write short answers.

1. When do accidents happen in school?
2. What precautions should you take to avoid accidental consumption of poisonous chemicals?
3. What is first aid?
4. Write about two common emergencies where you need first aid.



D. Answer these questions.

1. What precautions should you take to avoid accidents at school?
2. As a pedestrian, what will you do to avoid getting hurt on the road?
3. How will you help a person who has a bleeding wound?
4. How will you help a person who has fainted?
5. How will you help a person who has been bitten by an insect?

HOTS questions

E. Think and answer.

1. Your friend gets hurt while playing football with you in school. He has a cut on his knee. What should you do first of all?

2. All poisonous chemicals should be kept away from eatables in a separate cupboard. Why?

Let us do



ENRICHMENT ACTIVITY

- F. Your teacher will display a first-aid kit to the class and also discuss reasons for having such a kit on hand.

Now some of you will write down the names of some injuries and ailments on the blackboard, for example, cut, burn and headache. This list should form a column on the left. Pull out items from the first-aid kit and identify the items by name. Write the items on the right side of the board. Match the items to the injuries and ailments. If an item/injury has no match, add to the other column. For example: "You can use an antiseptic lotion on a minor cut." Write 'antiseptic lotion' on the right-hand side of the board, draw a line that matches it to 'cut'. Also, check if an antiseptic lotion is part of your first-aid box.

A life skill



- G. Be a 'medicine-watchman'.

Dia noticed her mother reading something written on the bottle before giving medicine to her sick brother. Do you think she was:

1. reading the name of the doctor?
2. finding out the amount of medicine to be given?
3. checking the expiry date on the bottle?
4. checking the price of the medicine?

Check the expiry date on the labels of the medicines at home. Ask your parents to throw away the medicines that have crossed the expiry date. We must never take any medicine without checking the expiry date.

Let us meet



The Red Cross Society is an international organization. It was founded by Jean Henri Dunant and his associates in Geneva, Switzerland in 1863. Today there are a large number of adults and young people from all over the world in the Red Cross Society. It does wartime service, runs hospitals and clinics, and trains community health workers. A few other important services are its blood service programme and disaster relief programme.



JEAN HENRI DUNANT

TEACHER'S NOTES: Read out in Class from the newspapers about some accidents. Discuss whether they could have been avoided. Demonstrate the giving of first aid (as suggested in the book). Encourage children to have a first-aid box in their house.

Check Your Understanding

Enrichment Activities

A. Class project!

Do you know how much fats, proteins and carbohydrates do potato chips, chocolate, milk and oil have? Find out for yourself. Take a notebook and a pencil. Go to a nearby market and visit a bakery shop, a grocery shop and a milk booth. You may request your father to go with you. Request the shopkeepers to show you the following packets:

a 5-rupee packet of potato chips, a 10-rupee chocolate bar, a half-kg packet of full cream milk, a half-kg packet of double toned milk, a half-kg packet of pure ghee
Observe these packets very carefully and fill in the following table.

	POTATO CHIPS	CHOCOLATE BAR	FULL CREAM MILK	DOUBLE TONED MILK	PURE GHEE
Fats					
Proteins					
Carbohydrates					
Energy					

What do you observe? Discuss with your partner. Write YES or NO.

- ❖ Should we avoid eating potato chips? _____
- ❖ Should we avoid eating chocolate? _____
- ❖ Should we also avoid eating junk food like pizza, burger and french fries? _____

B. We use a refrigerator to make ice cubes, to keep our drinks cool and preserving food. Let us see how does it preserve our food.

Take two of each of the following: tomato, lemon, cucumber, apple, mango

Keep one of each of the above inside the refrigerator. Keep the other one on a shelf in your kitchen. After five days, take out the items kept inside the refrigerator and compare them with those kept in the kitchen. What do you observe? Discuss with your mother and write in your notebook.

C. Let us grow fungus.

- ❖ Take a few pieces of orange in a small bowl.
- ❖ Sprinkle some water over them.
- ❖ Cover the bowl and keep it in a dark and warm place.
- ❖ Check the pieces after four days.

What do you observe? Discuss with your partner.



SAVE THE EARTH

Nature's Song



Tigers Forever

May there always be tigers, Lord.
 In the jungles and tall grass
 May the tiger's roar be heard,
 May his thunder
 Be known in the land.
 At the forest pool, by moonlight
 May he drink and raise his head
 Scenting the night wind.

RUSKIN BOND

Nature Notes

Conservation is the preservation and protection of the environment and the natural things in it. Each one of us can do our bit. This means that we must use things with care and not waste them. Here are some ways of doing this.

- ◆ Save paper! Use a slate for doing rough school work.
- ◆ Finish all your school work before sunset in natural light (without turning on electric bulbs or tubelights). You will save on electricity.
- ◆ Open the fridge door just a little bit. Do not keep it open for too long.
- ◆ When you need to fill a glass of drinking water, take only as much as you need.
- ◆ Save fuel! Whenever you can, walk or cycle to the place you have to go to.
- ◆ Use CFL bulbs and tubelights. They use less power to work than an ordinary bulb.
- ◆ Ask your parents to save cooking fuel by keeping the vessel covered in which food is being cooked. This helps to keep the heat in and food cooks faster.



Nature Cure

- ◆ Crush a few pods of garlic and apply the paste to a cut or a bruise.
- ◆ Crush a few tender leaves of the marigold plant. Add besan and apply it to a cut or a bruise.
- ◆ Grate an onion. Squeeze out the juice. With some clean cotton, apply this juice on an insect bite.
- ◆ Mix 3 or 4 crushed black pepper corns with a tablespoon of honey. Slowly lick it just before bedtime at night. It will soothe a sore throat.

NATURAL RESOURCES



Natural resources like land, water and air support life on earth. Oil, coal and even sunshine are natural resources which we use for fuel to run our vehicles and to heat our homes in winter.



Renewable Resources are things that we use and then replace. Nature has ways to replace resources. Trees are renewable resources. When a tree is cut down, more trees can be planted in its place.



Non-renewable Resources are those which cannot be replaced. Coal and oil are made from fossils. They take millions of years to form. They are available in limited amounts and take a very long time to renew.

Today we are using many of our resources faster than nature can create them.

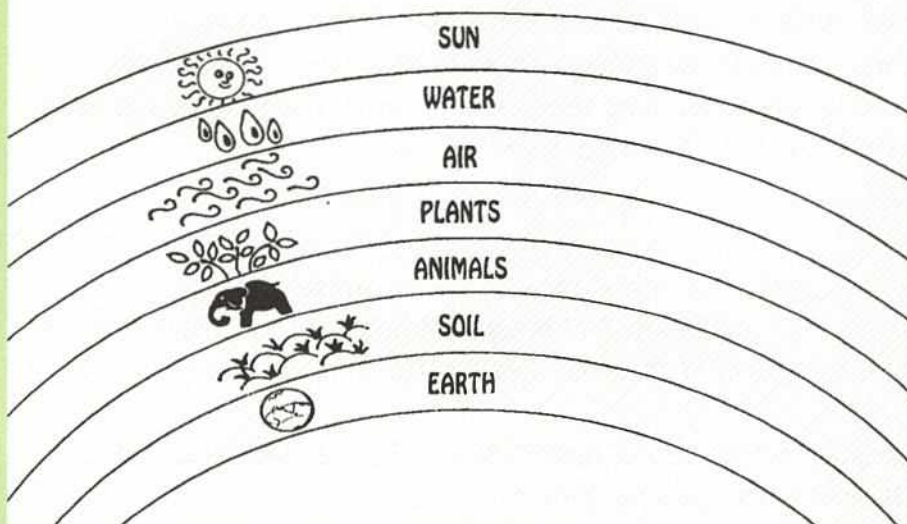
Oil Slick Sometimes offshore wells, leaky pipelines or oil tankers in the sea spill oil into the water. Oil and water do not mix. So oil forms a widespread film on the sea-water. This floating film is called an oil slick. Such oil spills cause harm to aquatic life.



HABITAT DESTRUCTION

People cut down forests for their needs. This is deforestation. It kills the plants and trees that provide food and homes to many animals. When the habitat of any animal is destroyed, it usually cannot move to some other place for food, space and shelter. When these homeless animals cannot find a place with a suitable environment, all the animals of that species simply die out and vanish from the face of the earth.

Colour the
Rainbow of Life
in its seven colours.



Spot the different sources of pollution in this picture.

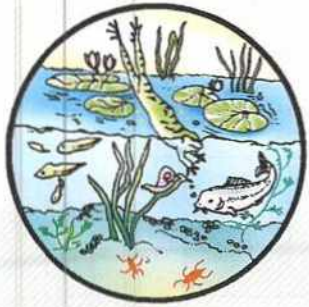
Hint: Look for things which cause

- air pollution
- water pollution
- land pollution
- noise pollution
- visual pollution



The oil coats the feathers of seabirds. This removes the air layer that protects them from the cold. Coated with oil, sea animals find it hard to dive for food or swim away from enemies. Fishes die when they cannot breathe because the oil clogs their gills. Water polluted by oil slicks is very difficult and costly to clean.

Spot the different plants and animals in each of these habitats.



A Pond



A Tree

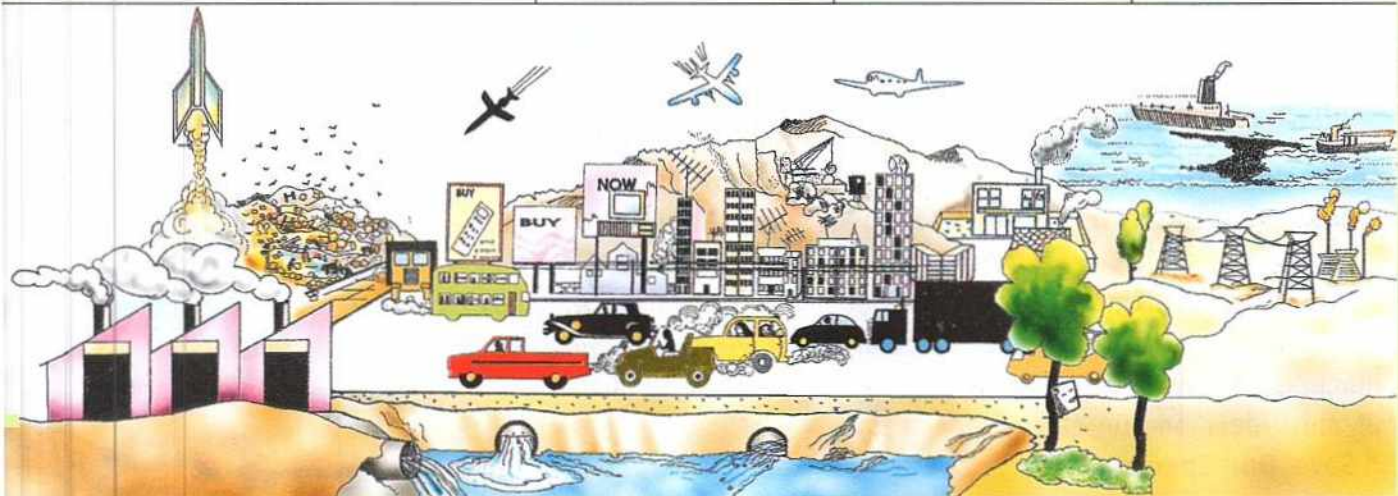
Waste is anything leftover or not used and thrown away as trash. Today there is so much waste and so little space to keep it. Let us follow the three Rs and control the waste we produce.



Reducing means using less. If we try to use fewer things, we will find lesser things to throw when we have no more use for them. Choose things that can be used again such as cloth towels and not paper towels. Do without things you do not really need. Before buying something, help keep the environment clean by asking yourself, "Do I really need it?"

Reusing is finding new uses of things that would normally be thrown away. Many things such as cardboard boxes, glass jars, cards, envelopes and plastic bags can be reused. Before you throw away a toy or a pen, think of all the other uses these can be put to.

Recycling is giving special treatment to waste so that it can be used again. Glass bottles can be crushed and melted to make new glass. Paper can be turned back into pulp and made into new paper. Aluminium and plastic can also be recycled. This way less waste is created.



'Earth Friend' Badge Place a bangle on the plain part of a used greeting card. Draw around it. Cut out the circle. Use sticky tape to paste a safety pin on the back of it. Paint it. Write 'Earth Friend'.

If you are a member of a nature club, teach others how to make the badge. All members can pin one on their dress.



Nature Quiz

Have fun solving this crossword full of energy!

Across

3. At dams, large reservoirs of water are used to tap this form of energy (5,8)
5. The hot interiors of the earth is a source of this energy (3,7)
7. Fuel used to run a car (6)
8. Energy from breaking up of atoms (6)
9. A torch uses energy stored in these (5)
11. Light bulbs use this form of energy (11)
12. Big machines that run on wind energy (9)

		1				2													
		3	Y				E				T						4		
						L													
			T																
	5	E	T						L				6				L		
											7	E							L
		8	A			M							9			L	10		
																			P
			11			C						I							
			12			I			M			L							

Down

1. Green plants trap energy from the sun during this process (14)
2. Energy from the sun (5)
4. Soft, black, fuel-rock (4)
6. In a car, electric energy is stored in this (7)
10. Cooking gas used at home (3)

SOS*



The musk deer can be seen in its natural habitat like in the Annapurna Conservation area.

The male musk deer has a musk pod in the abdomen near the navel under the skin. This musk has a strong smell. So, it is used for making perfumes. To get this pod, people kill the deer in great numbers. Because of this, the number of musk deer on the earth is decreasing.

*** Save Our Species**

Nature's Nook

Kaziranga National Park is located in Assam, India. The park hosts two-thirds of the world's Great One-horned Rhinoceroses. It has the highest density of tigers among protected areas in the world. The park is home to large numbers of elephants, wild water buffalos and swamp deer. It is also home to a variety of migratory birds, water birds and many scavengers.

The Right Clothes to Wear

AIMS

- To enable the student to
- know about different kinds of material used for making clothes.
 - select clothes suited to the different weather.
 - learn how to take care of clothes.

AIDS

- samples of different types of clothes—cotton, silk, woollen, synthetic
- pictures or films of costumes from different parts of India

Long ago, when humans lived in caves, they used animal skin, leaves and the bark of trees to cover themselves. Gradually they learnt the art of weaving and stitching clothes. These days we wear different types of clothes.

We need clothes all the time—clothes for home, clothes for school, clothes for play, clothes for a party and clothes for

sleeping in. Clothes are as important to us as a house.

WHY DO WE NEED CLOTHES?

Good clothes make us look smart. They protect our body from dust, heat, cold, rain and insect bites. If we wear the same dress for many hours, what happens? It becomes dirty. Dust settles on it. If we



Fig. 4.1 Clothes protect us from cold, rain and heat.

do not wear clothes, the dirt would stick to our body. **Clothes protect us from dust.**

People who work in the sun for a long time become tanned. The covered part of our body is usually fairer than the uncovered parts. This shows that **clothes protect us from the heat of the sun.**

During winter, we like to wear thick and warm clothes. They **protect us from the cold.**

When we go out in the rain, we wear raincoats. They are made of **waterproof** material. A raincoat **protects us from the rain.**

If we wear long-sleeved clothes at night, we can protect ourselves from mosquito bites. Clothes, therefore, **protect us from insect bites** too.

MATERIAL FOR CLOTHES

Clothes can be made from natural or synthetic materials.



Fig. 4.2 Cotton and jute are natural fibres obtained from plants.



Fig. 4.3 Wool and silk are natural fibres obtained from animals.

Natural fibres

Natural fibres are made from parts of plants or animals. We get fibres like cotton, jute and linen from plants. We get fibres like wool, silk and fur from animals.

Synthetic fibres

Synthetic fibres like nylon, rayon and polyester are not found in nature. They are prepared artificially and are called man-made fabrics. These fabrics are stretchable, waterproof and wrinkle-free. They dry very quickly. Synthetic fabrics are **non-porous**.

THE CLOTHES WE WEAR

In hot weather, we wear clothes made of cotton. Cotton clothes allow the body heat to escape. Cotton clothes absorb sweat also. White or light-coloured clothes suit the hot weather because they reflect the heat and keep the body cool.

In cold weather we wear woollen clothes. Woollen clothes keep our body warm.

People living in different regions wear different types of clothes, depending on



A NYLON TRACKSUIT

A POLYESTER JACKET

Fig. 4.4 Clothes made from synthetic fibres

WATERPROOF through which water cannot pass
NON-POROUS something that does not allow liquid or air to pass through it



Fig. 4.5 People from different places wear different types of clothes.

the climate and the tradition of the region. The dress of a person living in Srinagar will be different from that of a person living in Chennai. People living in different countries wear different types of clothes. The kind of clothes they wear depends on the type of weather in the region where they live. Some of these clothes have become national dresses. The national dress of an Indian woman is the saree and that of a Japanese woman is the kimono.

People wear special clothes for specific work. Doctors and nurses wear white

coats. People working in factories wear overalls. A soldier wears a uniform made from tough material so that it does not tear easily. You wear a uniform to school so that you can be recognized as a student of your school.

Socks and shoes

We wear socks and shoes to protect our feet from dust, heat, cold, germs and worms. Walking barefoot can cause cuts. Dirt, germs and worms may get into the cut and cause an infection. Do not wear wet or dirty socks or tight shoes.



SAREE (INDIA)



KIMONO (JAPAN)

Fig. 4.6 National dresses



A SOLDIER



A DOCTOR

Fig. 4.7 Special clothes are worn by some people depending on their work.

Oral Questions

Choose the correct answer.

1. We wear thick and warm clothes in summer / winter / rainy season.
2. Nylon / rayon / linen is a natural fibre which is obtained from plants.
3. People working in factories wear overalls / white clothes / sarees.
4. The national dress of a Japanese woman is saree / kimono / salwar kameez.

CARE OF CLOTHES

We must always wear clean clothes to stay healthy. After washing, the water should be properly squeezed out of clothes to help them dry faster. Clothes should be ironed to look neat. Silk and woollen clothes should be washed in gentle soap. They can be sent for drycleaning too. A tear in a dress should

be mended in time. Remember, a stitch in time saves nine!

A patient's clothes must always be **disinfected** with an antiseptic solution.






Storing of clothes

Clothes need good care, especially silk and woollen clothes because certain insects feed on silk and wool. Therefore, once the season is over these clothes must be kept out in the sun for a few hours or drycleaned. They should then be stored properly.

Keep mothballs or dried neem leaves between the folds of woollen clothes. These keep insects away. Proper care of clothes makes them last longer.

Clean clothes make us look smart and feel comfortable. Dirty clothes can cause skin diseases.

Let us say it again

-  Clothes protect us from dust, heat, cold, rain and insect bites.
-  We must wear clothes that are suited to the season.
-  Clean clothes make us look smart and keep us healthy.
-  Shoes and socks protect our feet from dust, heat, cold and infection.
-  Regular washing and proper storing of clothes make them last longer.

Let us answer

A. Tick (✓) the correct answer.

1. Long ago when humans lived in caves, they wore clothes made of
a. cotton. b. silk. c. animal skin. d. wool.

DISINFECTED (dis-in-fek-ted) freed from germs

2. Clothes do not protect us from
 - a. heat.
 - b. cold.
 - c. thieves.
 - d. dirt.
3. A patient's clothes should be
 - a. ironed.
 - b. mended.
 - c. disinfected.
 - d. wetted.
4. To keep insects away, these are kept between the folds of woollen clothes.
 - a. mothballs
 - b. sand
 - c. perfume
 - d. toffees

B. Write T for True or F for False.

1. Natural fibres are waterproof and germfree.
2. We should wear wet socks and tight shoes.
3. A raincoat protects us from getting wet in the rain.
4. Light-coloured clothes make us feel hot.
5. The national dress of an Indian woman is saree.



C. Write short answers.

1. What are natural fibres?
2. Write the names of two man-made fabrics.
3. Write the names of two countries and their national dresses.
4. Why do we wear socks and shoes?
5. Name two things used to protect woollen clothes from insects.

D. Answer these questions.

1. Why do we need clothes?
2. What is the difference between natural fibres and synthetic fibres?
3. Why do soldiers wear uniforms made from tough material?
4. How should we store clothes?

HOTS questions

E. Think and answer.

1. Maya's mother bought her some white dresses for summer. Why do you think white clothes are more comfortable for the hot weather?
2. Our nightwear should have long sleeves. Why?



Let us do



ENRICHMENT ACTIVITIES

F. These people are from different states of India. Read the clues and write the name of the state they come from.



Arti is from the state that has the Gateway of India.



Baldev is a Bhangra dancer.



Ranbir is from the desert state of India.



Gopa is from the state of the Hoogli river.

G. Collect pieces of three different kinds of fabrics. Observe them and fill in the blanks.

FABRIC	HOW DOES IT FEEL?	DOES IT STRETCH?	CAN YOU SEE THROUGH IT?
A	_____	_____	_____
B	_____	_____	_____
C	_____	_____	_____

Now with an adult's help stitch the pieces together and make a 'place-mat' to keep on your table.

H. Visit Shankar's International Dolls Museum in Delhi.

TO VISIT

Visit the Dolls Museum in Delhi to see the different costumes of different countries. Write your observations in your notebook. If you don't live in Delhi, visit rsg.in/lsc-4 and click on LINK 2 to know more about Shankar's International Dolls Museum.

TEACHER'S NOTES: Let some children bring their dolls to class. Show the textures and the styles of clothes. Discuss about the types of clothes according to the weather.

Solids, Liquids and Gases

AIMS

- To enable the student to
- understand and define matter.
 - identify the different states of matter and compare their properties.
 - understand the terms 'solute', 'solvent' and 'solution'.
 - conduct simple experiments.

AIDS

- a few stones, a glass of water, a bottle of cold drink, a bottle of perfume, containers of different shapes
- sugar, salt, chalk powder, beakers, spoon

Look around your room. You will see doors, windows, books, boxes, tumblers, water-bottles, pens, CDs and many other things. All these are made of different materials. Doors and windows are made of wood, glass or metal. Books and boxes are made of paper. Tumblers and bottles are

made of glass or plastic. CDs and pens are made of plastic. So, the things around us are made of different materials.

WHAT IS MATTER MADE UP OF?

All matter in the world is made up of molecules. Molecules are the smallest



Fig. 5.1 Things around us are made of different materials.

MATTER anything that occupies space and has weight

substances in matter that can exist independently. For example, a drop of water is made up of **molecules** of water.

STATES OF MATTER

Matter exists in three states—**solid**, **liquid** and **gas**.

Solids

Hold your pencil tightly. Do you feel its hardness? It is a solid. Solids have a fixed shape and a definite **volume**. Solids can be held. This is so because the **molecules** in a solid are tightly packed. They cannot move around. However, we can change the shape of some solids by using force. Press a rubber ball. The shape of the ball changes. So, solids have

- ☀ a **fixed shape** and
- ☀ a **fixed volume**.

Liquids

Milk is a liquid. Is it hard? Can you hold it in your hand? No. It does not have a fixed shape because the molecules in a liquid are loosely packed and can move around. It can be poured into a vessel. Liquids take the shape of the vessel in which they are kept. Thus, liquids

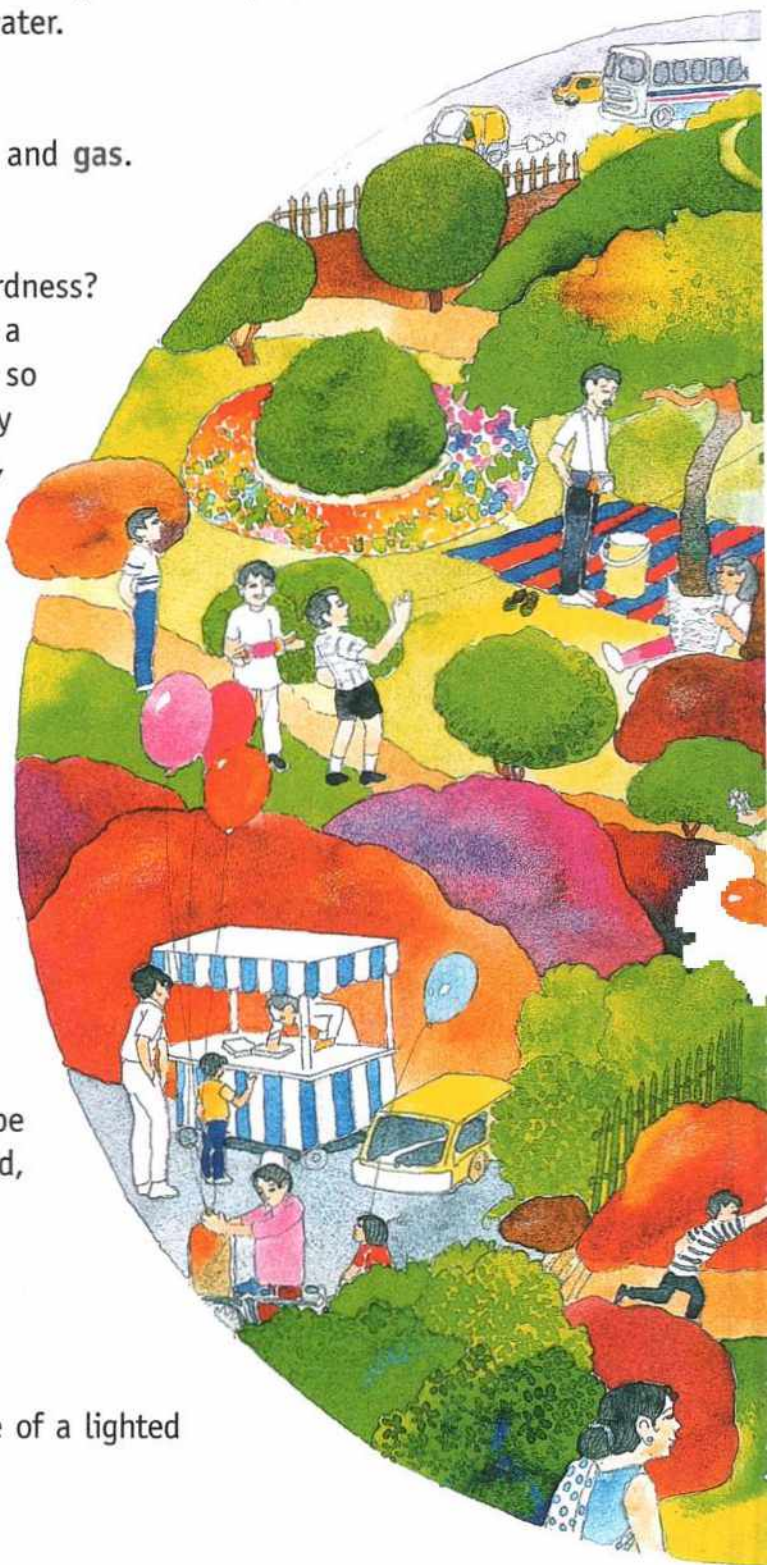
- ☀ have **no fixed shape**. They take the shape of the container in which they are poured,
- ☀ can be **poured**, and
- ☀ can **flow**.

However, liquids have a **fixed volume**.

Gases

Try to catch and hold in your hand the smoke of a lighted *agarbatti*. Can you do it? No.

Can you see the air around you? No.



MOLECULES (maw-li-kewls) tiny particles that make up matter
VOLUME (vaw-lyum) the space occupied by a solid, liquid or gas

Air is a mixture of gases. Smoke can be seen but air cannot be seen.

You cannot hold a gas in your hand. When air is filled into a balloon it takes up all the space inside the balloon. We can pump more and more air into a football. It means more air can be filled into the same space. The smell of a perfume spreads quickly from one corner of the room to the other.

This is so because the molecules in gases are very loosely packed and gases can flow easily.

Thus, gases

- ☀ have no fixed shape,
- ☀ have no fixed volume,
- ☀ fill the space of the vessel, and
- ☀ flow more easily than liquids.

ACTIVITY 1 Look at Figure 5.2. Identify some objects made up of solids, liquids and gases from it. Discuss in the class the reasons for your selection. List them below.

SOLIDS	LIQUIDS	GASES

STATES OF MATTER ARE INTERCHANGEABLE

Solid, liquid and gas are interchangeable states.

We have already studied about the three forms of water.

They are _____, _____ and _____

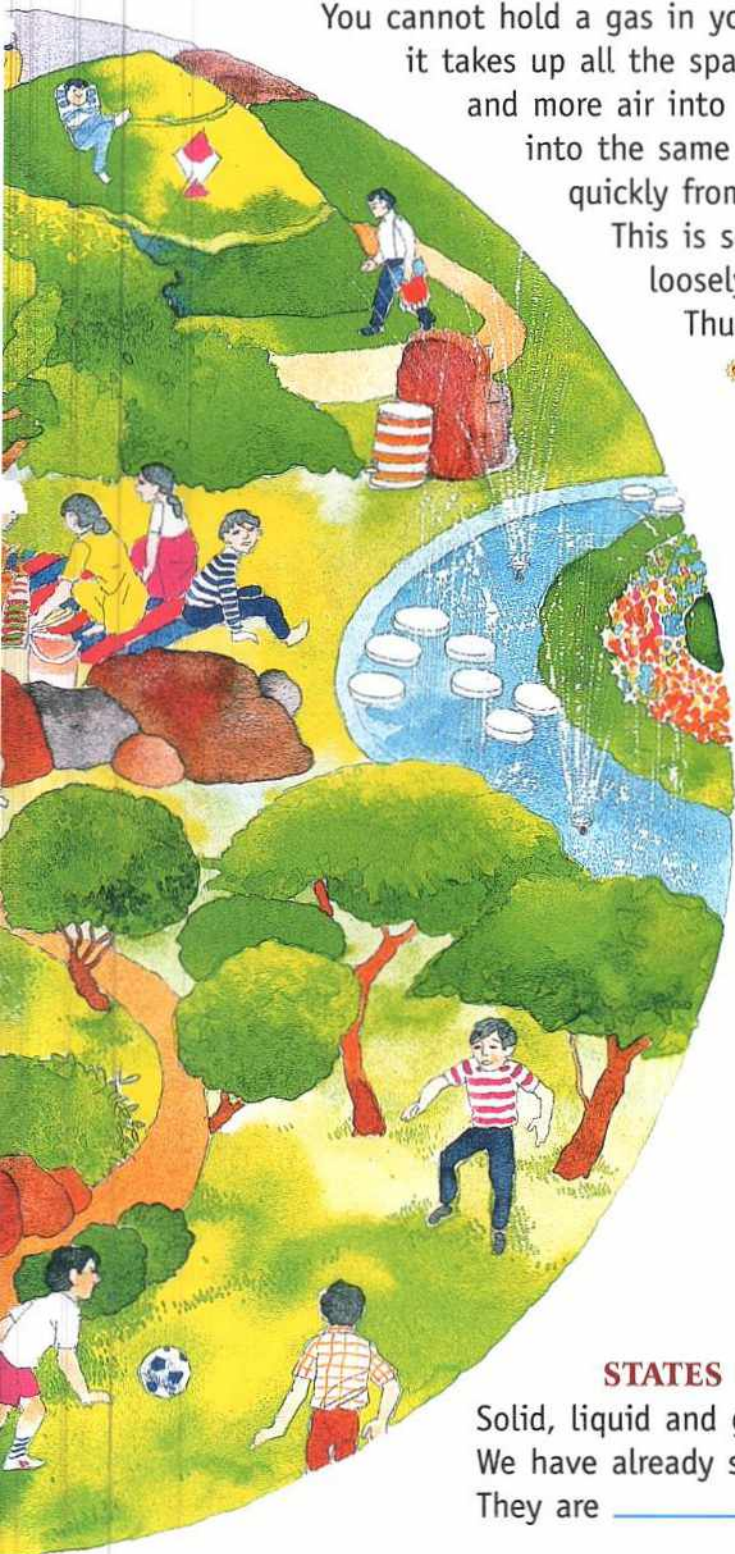


Fig. 5.2 Our world is made up of solids, liquids and gases.

ACTIVITY 2 Look at Figure 5.3 very carefully. Follow the sequence and fill in the table.

STEP	INITIAL STATE	HEATING/COOLING	FINAL STATE	PROCESS
A	ice	heating	water	melting
B				boiling
C		cooling		
D			ice	

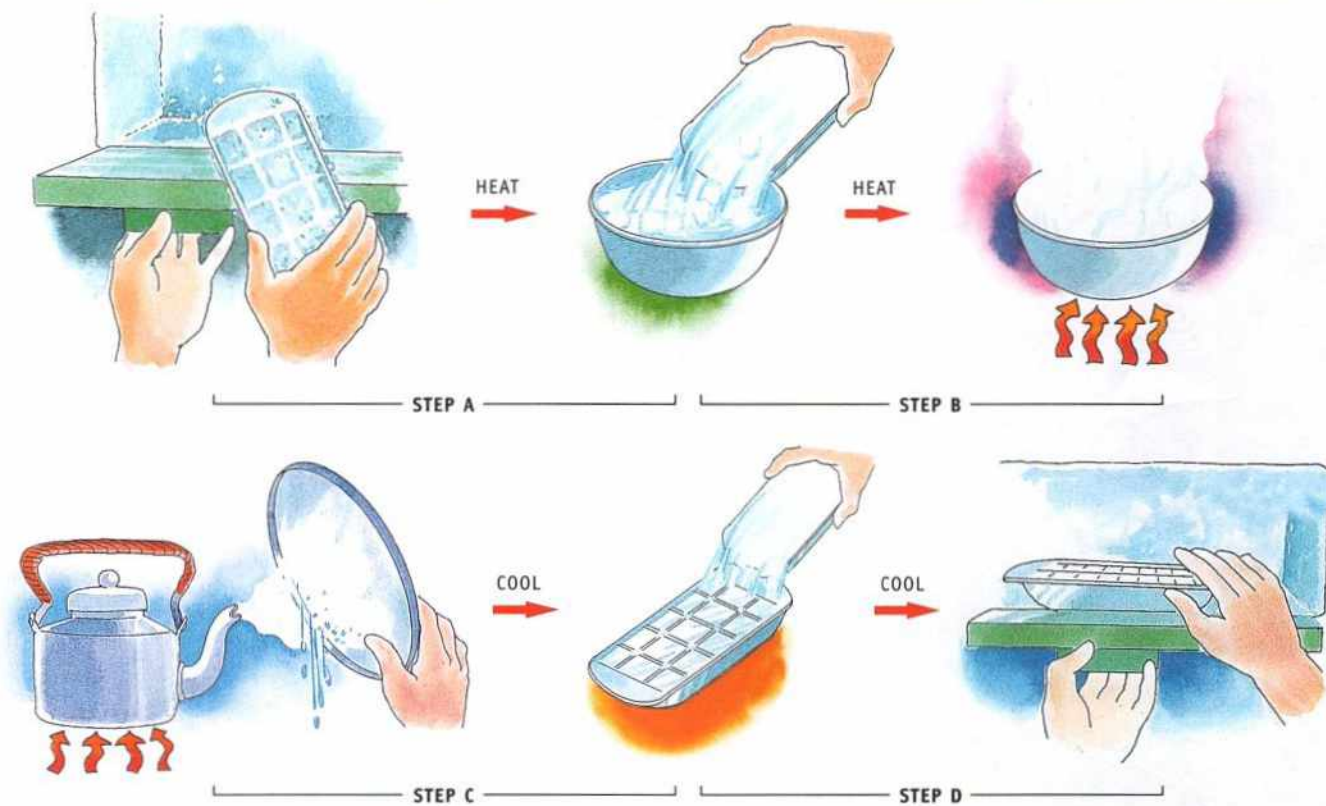


Fig. 5.3 States of matter are interchangeable.

It is clear from Figure 5.3 that one form of matter can be changed into another by heating or cooling.

Take a wax candle. Light it and let it burn (Fig. 5.4). Observe it carefully. What happens to the wax after some time?



Fig. 5.4 Solid wax melts on getting heated.

Oral Questions

Choose the correct answer.

1. Solids / Liquids / Gases have a fixed shape and a fixed volume.
2. Solids / Liquids / Gases take the shape of the container in which they are kept.
3. Gases have a fixed volume / a fixed shape / no shape.
4. Ice changes to liquid water on heating / cooling / crushing.
5. Steam / Ice / Wax changes to liquid water on cooling.

DISSOLVING SOLIDS IN WATER

ACTIVITY 3 Take a beaker half-filled with water. Put some sugar into it and stir well. Can you see the sugar now? No. Taste the water. Is it sweet? Yes. Why? This is because the sugar has dissolved in the water. The liquid is now a sugar solution. In this solution, sugar is the solute and water is the solvent. Because sugar dissolves easily in water, we say that sugar is soluble in water.



Fig. 5.5 Sugar dissolves in water.

What happens when sugar dissolves in water?

When we put sugar in water, its molecules scatter throughout the water. They occupy the empty spaces in between the molecules of water. This is why sugar seems to disappear when it is dissolved in water. The sugar solution does not look different from pure water. However, it tastes sweet.

Now let us compare the volume of the solvent and the solution through the following activity.

ACTIVITY 4 Take some water in a beaker. Mark the water level by pasting a strip of paper outside the beaker. Add three teaspoons of sugar to the water and stir well. What happens to the water level in the beaker? It remains the same.

The above activity shows that the volume of the solution remains almost the same as the volume of the solvent. This is because sugar does not take up any extra space. Its molecules only fill up the empty spaces between the molecules of water.

SUGAR	+	WATER	=	SWEET WATER
solute		solvent		solution
(a solid that dissolves in a liquid)		(a liquid in which a solid dissolves)		(the solute and the solvent together)

Let us say it again

- ☀ Matter occupies space and has weight.
- ☀ Matter is found in three states—solid, liquid and gas.
- ☀ A solid substance that dissolves in a liquid is called a solute.
- ☀ The liquid in which a solid dissolves is called a solvent.
- ☀ The solute and the solvent together form a solution.



Let us answer



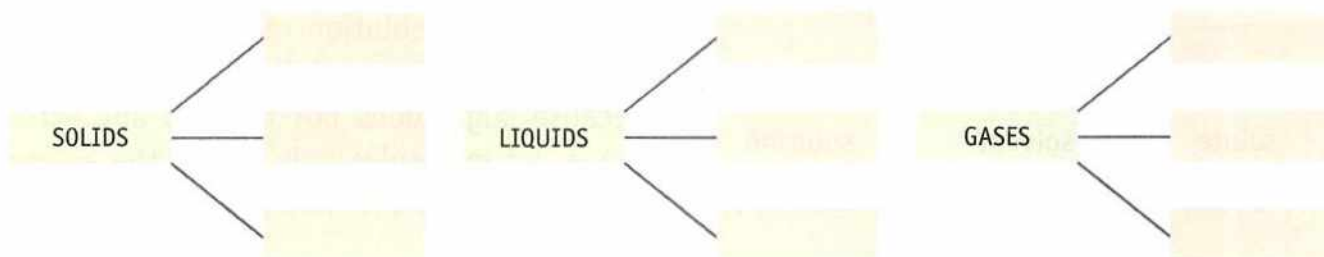
A. Tick (✓) the correct answer.

- This is a state of matter.
 - solid
 - sugar
 - salt
 - wax
- Which of the following is not a solid?
 - sugar
 - button
 - ink
 - rice
- Which of the following is soluble in water?
 - stone
 - salt
 - sand
 - rice
- Which of the following has a fixed volume?
 - stone
 - smoke
 - air
 - perfume

B. Write T for True or F for False.

- The molecules of solids are held together very loosely.
- Liquids do not have a fixed volume.
- Water changes into water vapour when it is frozen.
- In a water-sugar solution, water is the solute.
- Sugar is soluble in water.

C. Fill in the names of any three solids, liquids and gases in the empty boxes.



D. How are solids, liquids and gases different from each other? Fill in the table.

SOLIDS	LIQUIDS	GASES

E. Write short answers.

1. What is matter made up of?
2. What are molecules?
3. Name a solid that turns to liquid when taken out from the refrigerator.
4. Name a liquid that you drink often.
5. Name a gas that you use for breathing.

F. Answer these questions.

1. How will you show that a gas does not have a fixed volume?
2. What is the difference between the following two solutions?
 - a. sugar in water
 - b. sand in water
3. When sugar is dissolved in water the volume of the solution does not change. Why?

HOTS questions

G. Think and answer.

1. We always need to store liquids in containers. Why?
2. The smell of a perfume spreads very quickly from one corner of the room to the other. Why?

Let us do



ENRICHMENT ACTIVITIES

H. See how water expands on freezing.

- ❖ Half fill a jug with water. Mark its level.
- ❖ Place the jug in the freezer of your refrigerator. Take it out when the water in it is completely frozen.
- ❖ Mark the level of ice in the jug now. Is it lower or higher than the previous level? What do you observe?
Ice occupies more space than the same amount of water.



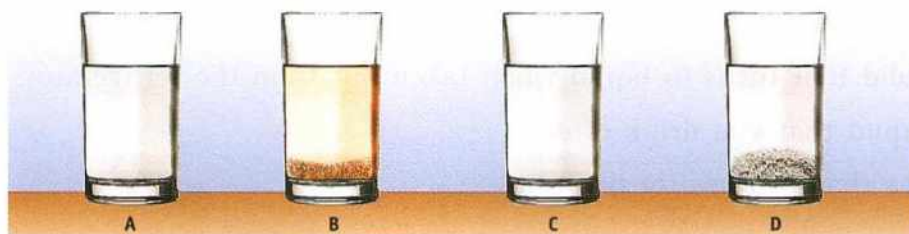
I. Write a secret message!

Grate an onion and squeeze the pulp to get juice. Dip an empty refill into the juice and write on a paper. Can you read it? No! Carefully hold the paper over a candle flame.

Now you can read the word! You can see the writing now because onion juice burns at a lower temperature than paper. You can try this with lemon juice too. Write this secret message—SAVE THE EARTH and then hold the paper over a candle flame and ask your friend to read it.



- J. For this experiment you will need four glass tumblers marked A, B, C, D, four spoons, water, sugar, sand, salt and chalk powder.



Take an equal quantity of water in each tumbler. Add two spoons of sugar, sand, salt and chalk powder to glasses A, B, C and D respectively. Stir well. Leave the tumblers undisturbed for ten minutes. Tick (✓) the tumbler in the picture above in which you can see the solid.

- a. Tumbler A b. Tumbler B c. Tumbler C d. Tumbler D

What does this experiment show?

- K. Visit an ice factory.

TO VISIT

Visit an ice factory to see how ice is manufactured. Write your observations in your notebook.

Let us meet



Joseph B Priestley (1733–1804) He did not learn science formally, but was able to think up brilliant experiments. By forcing what he called ‘fixed air’ (which we now know as carbon dioxide) into water he invented soda water. In August 1774, he discovered oxygen and was able to show that this gas is necessary for breathing and for burning.



J B Priestley

A subject link



(MATHEMATICS)

- L. Sahil has 5 L of water in a bucket which he wants to put in different containers to see the shape that the water takes! He has a bowl with a capacity of 350 mL. He has a jar with a capacity of 1.5 L. He has a bottle with a capacity of 900 mL. He has a glass with a capacity of 200 mL. After he fills up these vessels, how much water will be left in the bucket?

TEACHER'S NOTES: Display samples of matter in the class and ask children to identify them. Guide the children to compare the different states of matter and learn their definitions. Develop interest in conducting experiments. Let children make solutions with solute and solvent.

Plants: Preparing and Storing Food

AIMS

- To enable the student to
- see the structure of a typical green leaf.
 - understand and appreciate the process of photosynthesis in green leaves.
 - recognize the interdependence between plants and animals, and the energy flow between them.
 - understand the importance of programmes like *Vanamahotsava*.
 - conduct simple laboratory tests.

AIDS

- animation on food preparation in plants
- fresh leaves of mustard, lily, balsam, coleus, tradescantia
- preserved or fresh specimens of potato, carrot, brinjal, sugar cane, spinach, peas
- specimens of mould and mushroom
- black paper strip, pin, stove, iodine solution, alcohol, beaker, petridish
- a microscope and a permanent slide of the cross section of a leaf

How green and beautiful is this tree! It is full of green leaves. Why are leaves green? Why do most plants and trees have green leaves? The presence of a substance called

chlorophyll makes a leaf green. Only green leaves can make food for the plant since they contain chlorophyll. Green leaves need air, water and sunlight to prepare food.

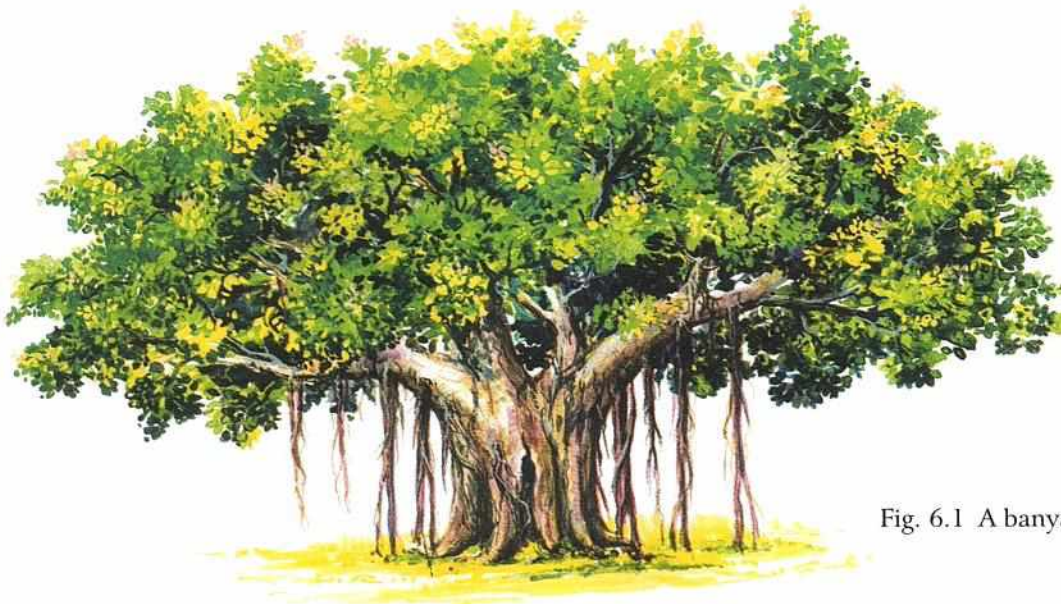


Fig. 6.1 A banyan tree

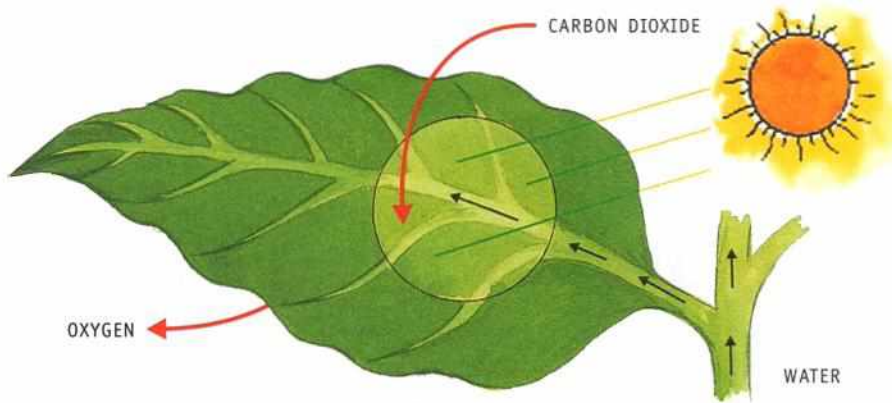


Fig. 6.2 Green leaves need water, carbon dioxide (air) and sunlight to prepare food.

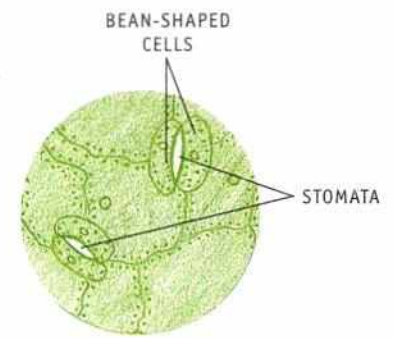


Fig. 6.3 Stomata as seen under a microscope

FOOD FOR PLANTS

A plant takes in water from the soil and carbon dioxide from the air. In the presence of sunlight, green leaves change air and water into food in the form of starch. Sunlight provides energy to these leaves for preparing food. Hence, **water, carbon dioxide, chlorophyll and sunlight** are needed by leaves to prepare food.

'Photo' means light and 'synthesis' means putting together. Since sunlight is required to put water and carbon dioxide together as food, this process is called **photosynthesis**.

PARTS OF A LEAF

Take a peepal leaf. Observe the lower

surface of the leaf. You will see a **main vein** running along the centre of the leaf. It has a number of **side veins**. The main vein is called **midrib**. It is formed by a double pipeline of cells. One pipeline carries water and minerals to all the cells of the leaf. The other carries prepared food from the green cells to the other parts of the plant.

On the underside of a leaf are tiny pores called **stomata** (singular, stoma). During photosynthesis, a leaf takes in carbon dioxide and gives out oxygen and water vapour through the stomata.



MANGO (FRUIT)



SPINACH (LEAVES)



PEAS (SEEDS)



CARROT (ROOT)



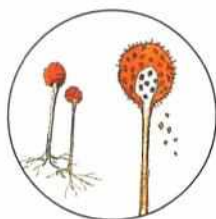
SUGARCANE (STEM)

Fig. 6.4 Food is stored in the fruits, leaves, seeds, roots or stems of plants.

PHOTOSYNTHESIS (fo-tow-sin-thes-is) the process of preparation of food by green leaves of plants
STOMATA (stom-ma-ta) openings on the underside of a leaf



CACTUS



MOULDS



MUSHROOMS



CROTON

Fig. 6.5 Some unusual plants

HOW DO PLANTS USE THEIR FOOD?

The food prepared by plants is in the form of **simple sugar**. It is used in a number of ways by the plant.

- It is used to get energy.
- Some of it is used for growth.
- Extra food is stored in the form of **starch** in leaves, stems or roots.

We eat that part of a plant which has food stored in it (Fig. 6.4).

Oral Questions

Choose the correct answer.

1. Photosynthesis takes place in a leaf / flower / root.
2. The main vein / leaf / stem is formed by a double pipeline of cells.
3. Plants prepare food in the form of simple sugar / salt.

SOME UNUSUAL PLANTS

Some plants like the cactus do not have leaves. Where, then, is their food made? It is made in their green stems.

Moulds and **mushrooms** are non-green plants. They do not have chlorophyll. They cannot make their food. They get their food from dead and decaying plants and animals.

The leaves of some plants like the **croton** have chlorophyll, but they appear dark red. This is because of the presence of a red substance that hides the green chlorophyll.

Does photosynthesis take place in such leaves? Yes, it does, because chlorophyll is present.

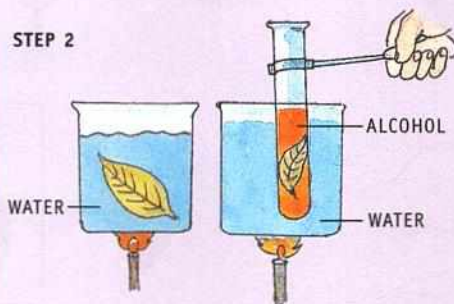
ACTIVITY 1 Does a green leaf have starch?

STEP 1



Pick a fallen green leaf of a healthy plant.

STEP 2



Bleach the leaf by first boiling it in water and then boiling it in alcohol.

STEP 3



Wash it in cold water.

STEP 4



Add a few drops of iodine.

CONCLUSION: When you add iodine to the bleached leaf, it turns blue-black. This shows that starch is present in a green leaf.

ACTIVITY 2 Is sunlight needed for photosynthesis?

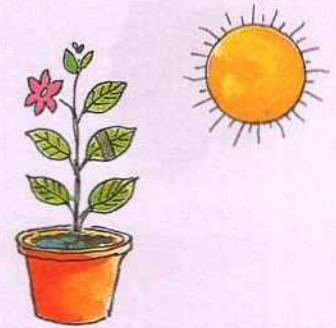
STEP 1

Take a healthy potted plant and keep it in the dark for about 24 hours.

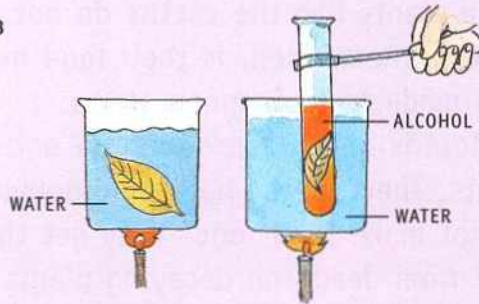


STEP 2

Cover one of its leaves partly with a strip of black paper. Keep the plant out in the sunlight for 4-5 hours.

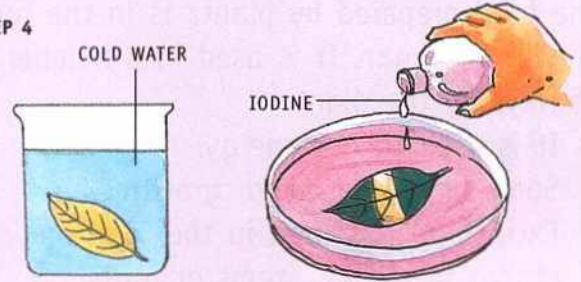


STEP 3



Bleach the covered leaf by first boiling it in water and then boiling it in alcohol.

STEP 4



Wash it in cold water.

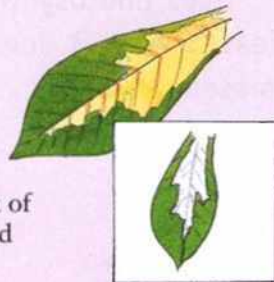
Add a few drops of iodine.

CONCLUSION: The part of the leaf that was covered with black paper does not turn blue-black. This part of the leaf does not contain starch, because it did not get any sunlight. So, sunlight is needed for photosynthesis.

ACTIVITY 3 Is chlorophyll needed for photosynthesis?

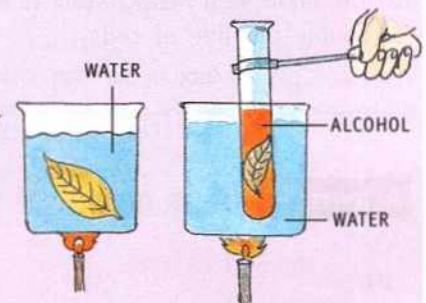
STEP 1

Take a coleus leaf. Draw its outline on a sheet of paper. Mark the green and non-green areas.



STEP 2

Bleach the leaf by first boiling it in water and then boiling it in alcohol.



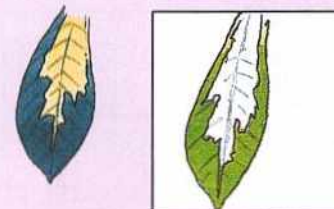
STEP 3



Wash it in cold water.

Add a few drops of iodine.

STEP 4



With the help of the paper outline, find out which parts of the leaf turn blue-black.

CONCLUSION: The parts of the leaf which are green in colour show the presence of starch. This shows that the green substance, that is, chlorophyll is needed for photosynthesis.

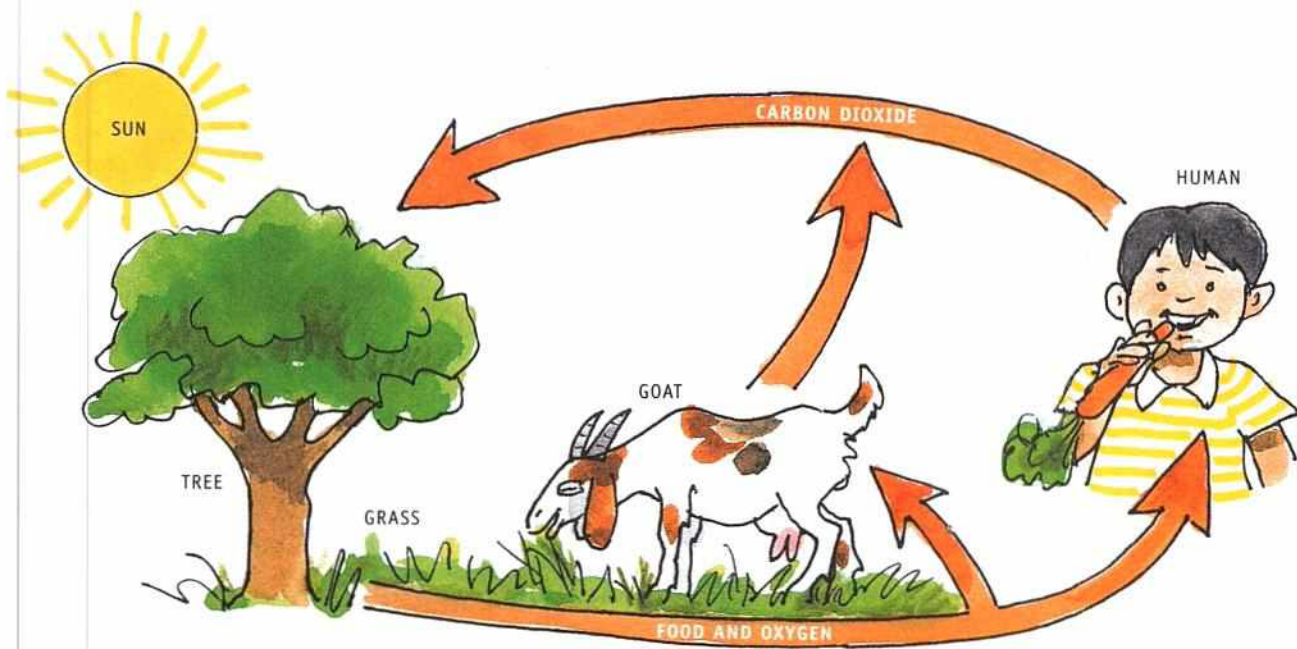


Fig. 6.6 Interdependence between plants and animals

ENERGY FLOW IN LIVING THINGS

We need energy for every activity we do. This energy comes from food. This food is prepared by green plants. Green plants trap the sun's energy during photosynthesis to prepare food. This energy is passed on to humans and animals when they eat the plants. This way energy flows from the sun to plants and then to animals and human beings.

ANIMALS AND PLANTS DEPEND ON EACH OTHER

Animals and plants depend on each other for survival. Animals need food to eat and oxygen to breathe. Plants give animals this food and oxygen. This is why fish live longer in an aquarium with water plants in it, than in one without them.

Plants need carbon dioxide to prepare food. Animals breathe out carbon dioxide. This is used by plants. So, plants and animals depend on each other.

PLANTS: PREPARING AND STORING FOOD

BALANCE IN NATURE

A balance needs to be maintained between the number of plants and animals. What will happen if there is a sudden increase in the number of animals? Plants may not be able to supply enough food and oxygen to all the animals. Or, if there is a sudden increase in the number of plants, the carbon dioxide breathed out by animals may not be enough for the plants. Similarly, if there is a sudden decrease in the numbers of either plants or animals it will disturb the balance in nature.

To maintain this balance in nature, we have to protect both plant and

THINK GREEN!

5 June is **World Environment Day**. Plant a few saplings in your school or at home. You can do so on your birthday too. Look after the plant as it grows into a tree. It may bear fruit and it will give shade to all.

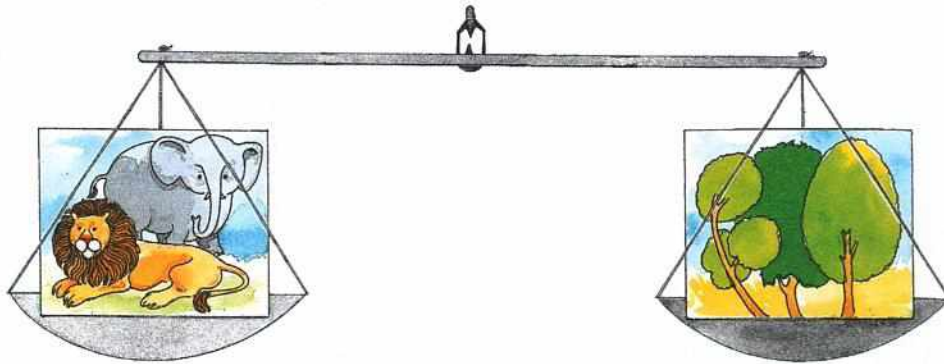








Fig. 6.7 A balance in nature must be maintained for life on earth to go on.

animal life. Under wildlife protection programmes, wild animals are given special protection in forest reserves and sanctuaries. Programmes like *Vanamahotsava* help promote the

planting of trees. People are made aware of the harmful effects caused by the continuous cutting down of trees.

If life on earth has to go on, a balance in nature must be maintained.

Let us say it again

-  The process of preparation of food in the green leaves of plants is known as photosynthesis.
-  Water, carbon dioxide, chlorophyll and sunlight are required by plants to prepare food.
-  Leaves have a. stomata to take in carbon dioxide and give out oxygen and water vapour, b. veins to carry water and food, and c. green cells with chlorophyll to make food.
-  The food or sugar made by a leaf is a. burnt to give energy, b. used by the plant to grow, and c. stored as starch.
-  The flow of energy from the sun to plants and then to animals and humans helps them both to survive.
-  A balance between plant and animal life is needed for life on earth to go on.

Let us answer

A. Tick (✓) the correct answer.

1. The main vein of a leaf carries

a. chlorophyll.	b. oxygen.	c. food.
-----------------	------------	----------
2. Air enters a plant through the stomata on its

a. leaves.	b. flowers.	c. stem.
------------	-------------	----------
3. Which of the following is a non-green plant?

a. cactus	b. croton	c. neem
-----------	-----------	---------

4. Removing the green pigment in a leaf is called
 - a. photosynthesis.
 - b. bleaching.
 - c. breathing.
5. Which programme helps to save trees?
 - a. Vanamahotsava
 - b. Project Tiger
 - c. Operation Flood

B. Fill in the blanks.

1. The presence of a substance called _____ makes a leaf green.
2. The process by which food is prepared in plants is called _____
3. _____ are openings on the underside of a leaf.
4. Moulds and _____ are non-green plants.
5. Animals need food to eat and _____ to breathe.

C. Write short answers.

1. What do green leaves need to produce food?
2. From where do leaves get energy for preparing food?
3. In what form is extra food stored in plants?
4. Name the part of a cactus plant that prepares food for the plant.
5. Leaves of croton appear dark red. Do these leaves have chlorophyll?

D. Answer these questions.

1. How would you show that a green leaf has starch in it?
2. Write the functions of the stomata.
3. How do plants use their food?
4. How is energy from the sun passed on to other animals?
5. How do plants without chlorophyll survive?
6. A balance between plants and animals is essential. Why?



HOTS questions

E. Think and answer.

1. The leaves of a plant kept in the dark do not produce starch. Why?
2. A yellow leaf cannot prepare food. Why?
3. Fish live longer in an aquarium with water plants in it, than in one without them. Why?



Let us do



ENRICHMENT ACTIVITIES

F. Can you name us?

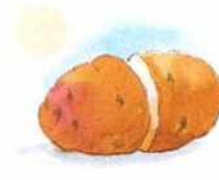
1. We are given out by the leaves of a plant. oxygen
2. We are taken in by the roots of a plant. minerals
3. We store a lot of starch for you. rice
4. We are two chemicals needed to test a leaf for starch. iodine solution

G. Check out the stomata!

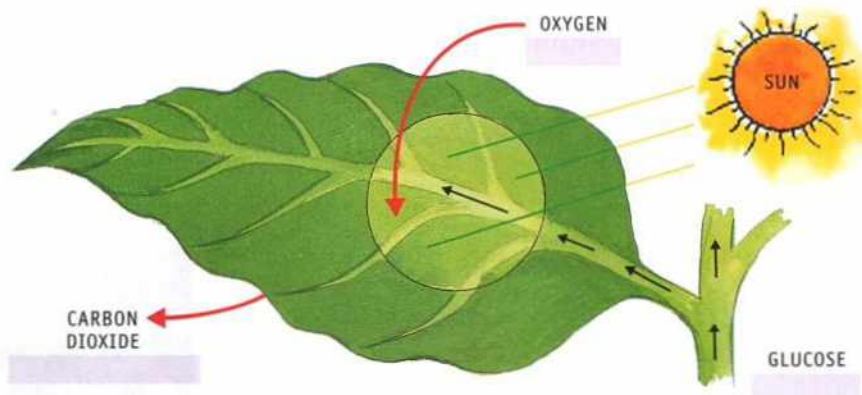
Take a potted plant. Apply a heavy layer of vaseline on the top of a few leaves. Cover them with a polythene bag. Now, apply a heavy layer of vaseline on the underside of 4–5 other leaves. Cover them with polythene bags. Observe the leaves daily for a week. What difference do you see? Why?



H. Add a drop of iodine solution to each the following. Tick (✓) the ones that turn blue-black. Discuss with your partner why this happens.



I. Rohan was asked to label the following diagram showing the process of photosynthesis. He labelled some parts incorrectly. Correct the labelling.



J. Visit a botanical garden or a nursery in your town. Find out the names of at least three new plants.

TO VISIT

A life skill



K. Grow greens in earthen pots or in your garden.

Mummy! Can we have our own kitchen garden at home?

Oh, yes! Why not?

What kinds of vegetables can we grow in our kitchen garden?

We can grow dhaniya, ladies finger, tomato and green chilli.



A subject link



(ENGLISH)

L. Which words in the poem mean the same as the words below?

Write them on the blanks.

1. Circular _____ round _____
2. Seven days _____
3. Small _____
4. A few _____
5. Fit _____
6. Flower _____



LITTLE BROWN SEED

Little brown seed, round and round
Here I put you in the ground.
You can sleep a week or two,
Then—I'll tell you what to do:
You must grow some downward roots,
Then some tiny upward shoots.
From those green shoots' folded sheaves,
Soon must come some healthy leaves,
When the leaves have time to grow,
Next a bunch of buds must show.
Last of all, the buds must spread,
Into blossoms white or red.
There, seed! I've done my best,
Please do grow and do the rest.

RODNEY BENNETT

TEACHER'S NOTES: Let the children see the internal parts of a leaf under a microscope. Holding a leaf in their hand, the parts of a leaf could be showed. The starch test can be conducted in class or at home. Show some fruits, leaves, seeds, roots or stems of plants where food is stored.

Plants: Living and Surviving

AIMS

- To enable the student to
- classify plants according to their habitats.
 - analyse how plants are affected by their surroundings.
 - understand how plants of the grass family are useful to us.

AIDS

- 🌐 tourism websites of different states
- 🌐 specimens or pictures of water plants like lotus, hydrilla, duckweed
- 🌐 specimens or film clippings of fields of wheat, rice, sugarcane, bamboo, brinjal, spinach, peas

Plants grow on mountain slopes, on ocean beds, in deserts and in river valleys. In fact they grow almost everywhere.

Plants differ from each other depending on the surroundings where they grow. Let us read about them.

TERRESTRIAL PLANTS

The word 'terrestrial' means living on land. Most plants grow on land. Plants that grow on land are called **terrestrial plants**.

- 🌳 In **hilly areas**, where it is generally cold, trees are tall and straight. These trees have needle-like leaves. Instead of flowers these trees bear cones. The pine, fir and cedar



Fig. 7.1 Plants differ depending on the surroundings where they grow.

(deodar) are some such trees. Spruce trees are found in very cold places.

- 🌳 In the **plains**, trees have lots of branches. These trees can bear the heat, but shed their leaves during winter. Mango, sheesham, peepal, banyan and sal are some such trees.
- 🌳 In **hot and damp areas**, trees have lots of leaves. But they do not shed their leaves in winter. They remain evergreen like the teak and coconut trees. Some other plants that grow in such places are pepper, rubber, sugarcane, rice and cotton.

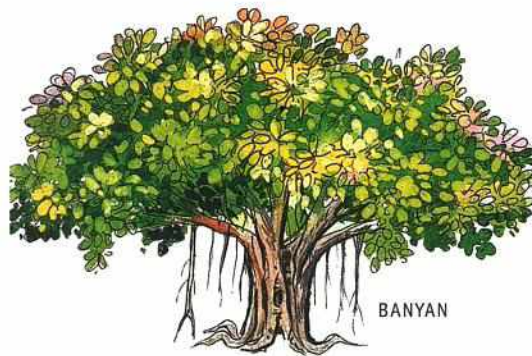


Fig. 7.2 Trees growing in the plains have lots of branches.

• In **deserts**, most plants grow without leaves. Cactus (Fig. 7.3) and palm are some such plants. Plants growing in deserts have spines instead of leaves. Spines prevent the loss of water and thus plants retain water. Then how do these plants make food in the absence of leaves? The green, fleshy stem of such plants contains chlorophyll and makes food. It also stores food and water.

• In **marshy areas**, the soil is sticky and clayey. The trees that grow here are called **mangroves** (Fig. 7.4). Their roots do not get air as the soil is covered with water. So, the roots grow out of the soil and water to breathe. Such roots are called **breathing roots**.



Fig. 7.3 Cactus is a desert plant.

AQUATIC PLANTS

Plants that grow in water are called **aquatic plants**.

Have you seen a pond full of plants? Many small and big plants grow in a pond. Among them, some float on water while others grow completely underwater (Fig. 7.5, 7.6).

Aquatic plants are of three types—floating plants, fixed plants and underwater plants.

Floating plants

These plants float because they are either light or small in size. Duckweed, water lettuce and water hyacinth are some such plants. These plants protect small water animals from the heat of the sun.



Fig. 7.4 Mangroves grow in marshy areas.



Fig. 7.5 Some aquatic plants

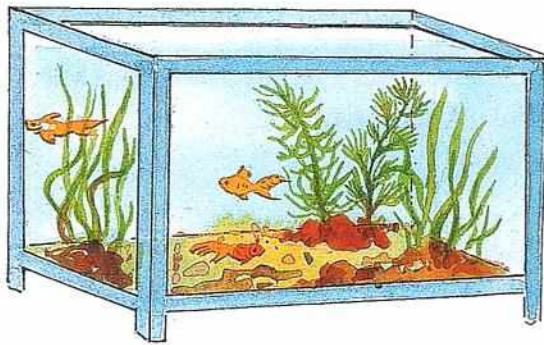


Fig. 7.6 Tape grass in an aquarium

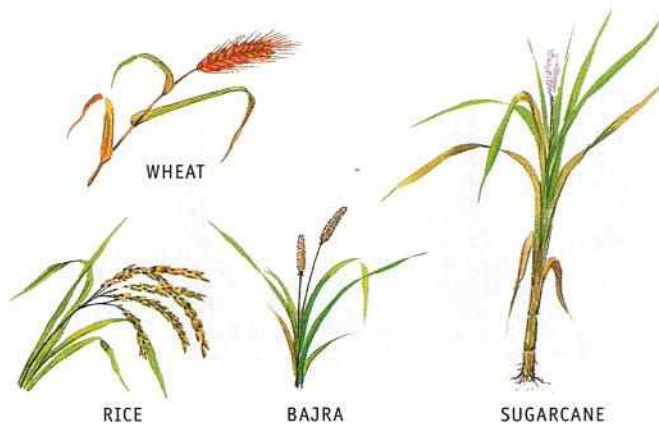


Fig. 7.7 Some plants of the grass family

Fixed plants

Some plants are fixed to the bed of the pond. You must have seen plants like the lotus and the water lily. The lotus flower is beautiful. The stem of the lotus is hollow and light which keeps the leaves and the flowers afloat. This is also used to make tasty dishes. The leaves are broad and have stomata only on the upper side. These broad, floating leaves provide a nesting place for some tiny birds.

Underwater plants

Plants like tape grass and pondweed remain under water. These plants have long, ribbon-like, narrow leaves. These leaves arise in clusters from the roots and have no stomata at all. They breathe through their body surface. These plants clean the water by removing the carbon dioxide breathed out by aquatic animals like fish and turtles. This is why we put such plants in aquariums.

Oral Questions

Choose the correct answer.

1. Cactus is a desert / aquatic / terrestrial plant.
2. In marshy / desert / hilly areas the soil is clayey and sticky.
3. Duckweed and water lettuce are underwater / fixed / floating plants.

PLANTS OF THE GRASS FAMILY

Cereal plants belong to the grass family of the plant kingdom. These plants are useful to us in many ways.

- They provide food for humans and animals. Wheat, rice, jowar, bajra, sugar and fodder are obtained from plants of the grass family.

- Bamboo plants are actually giant grass. Bamboo is used for making things like brooms, baskets, chairs, mats, curtains, toys and huts. Bamboo shoots have a high nutritional value and are rich in vitamins, cellulose and amino acids. In many parts of India, specially in the north-east, these are used to prepare tasty dishes.
- Paper was first made by the people of Egypt from a grass called **papyrus**. From 'papyrus' comes the word paper. Various kinds of grasses are now used to make different types of paper.
- Some plants of the grass family are used in preparing medicines.
- Dried grass is used as packing material.
- The roots of the plants of the grass family help to conserve soil.



Fig. 7.8 Bamboo plants and some products made of it

SOME UNUSUAL PLANTS

We all know that some animals eat plants. But do you know that there are some plants which eat animals (insects)! They are called **insectivorous plants**. In Venus flytrap, for example, the leaf is folded into two halves. When an insect sits on the leaf, the two halves close and the insect is trapped. The pitcher plant and the sundew are other examples of insectivorous plants (Fig. 7.9).

RAINFORESTS

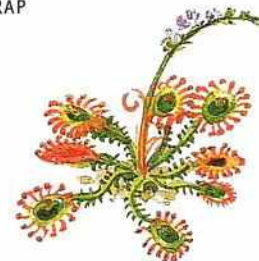
Rainforests are hot and wet forests that are found mostly near the equator. Most rainforests exist in parts of Asia, Africa, South America and Australia.



VENUS FLYTRAP



PITCHER PLANT



SUNDEW

Fig. 7.9 Some insectivorous plants

IT'S A FACT!






- Climbers that grow in rainforests are called lianas. Some are as thick and strong as ropes.
- Every year an area of rainforests, larger than Kerala, is cut down in the world.

INSECTIVOROUS (in-sek-ti-vo-rus) **PLANTS** plants that eat insects

In rainforests, there are both tall and short trees with lots of climbers around. The ground is covered with leaves, ferns

and fungi. The thick growth of leaves creates dark areas having an umbrella-like shape. A wide variety of animals are found here.

Let us say it again

-  Plants have different features to suit their natural surroundings.
-  In hilly areas, plants have needle-like leaves. In the plains, plants have lots of branches. In deserts, plants have no leaves at all.
-  Aquatic plants have special features to help them float or stay under water.
-  Plants of the grass family are useful to us in many ways.
-  Insectivorous plants eat insects.

Let us answer

A. Tick (✓) the correct answer.

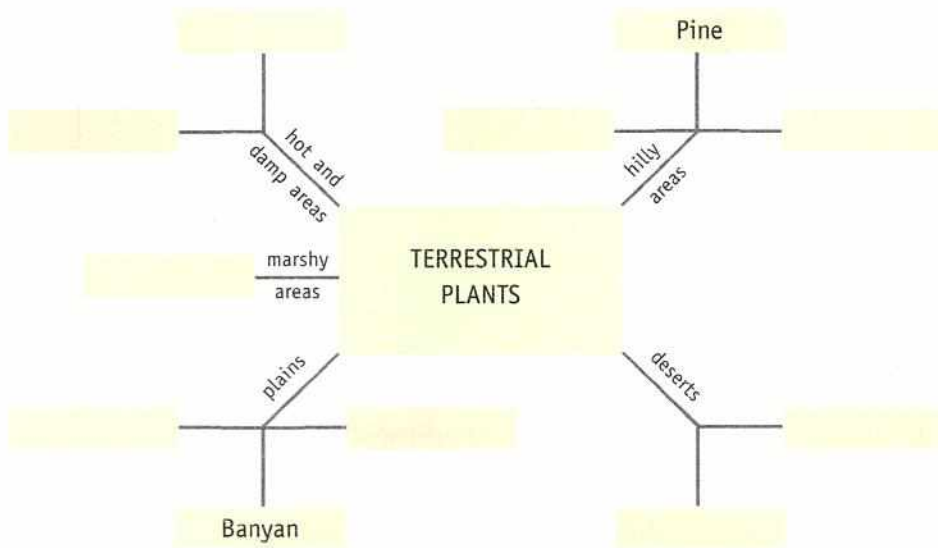
1. Plants growing in hilly areas have
 - a. no leaves.
 - b. needle-like leaves.
 - c. broad leaves.
2. A cactus plant saves water by
 - a. not having leaves.
 - b. not having a stem.
 - c. not having roots.
3. Floating water plants help small water animals by giving them
 - a. shade from the sun.
 - b. food and water.
 - c. water and minerals.
4. A lotus plant has
 - a. needle-like leaves.
 - b. very thin leaves.
 - c. broad leaves.
5. The main food that plants of the grass family give us are
 - a. fruits and nuts.
 - b. wheat and rice.
 - c. straw and sugarcane.

B. Match each terrestrial plant with the place where it grows.

- | | |
|--------------|----------------------|
| 1. coconut | a. plains |
| 2. mango | b. desert |
| 3. pepper | c. hilly area |
| 4. cactus | d. coastal area |
| 5. pine | e. marshy area |
| 6. mangroves | f. hot and damp area |



C. Plants that grow on land are called _____ plants. Fill in the names of such plants in the empty boxes.



D. Plants that grow in water are called _____ plants. Beginning with the second letter cross out every alternate letter to get the answer. Write two examples of each kind.

A C Q A U I A P T A I T C

1. Floating plants, e.g., _____
2. Fixed plants, e.g., _____
3. Underwater plants, e.g., _____

E. Write short answers.

1. Name five plants of the grass family that provide us food.
2. Name some products of the bamboo plant.
3. Name any two insectivorous plants.
4. Name a plant that has spines instead of leaves.
5. Name the family of plants which gives us cereals.



F. Answer these questions.

1. How do breathing roots help a plant that grows in a marshy area?
2. A lotus plant grows in water. How does it adapt itself to live in water?
3. What are the main uses of the plants of the grass family?
4. How does the Venus flytrap eat insects?

HOTS questions

G. Think and answer.

1. A lotus plant cannot grow in the desert. Why?
2. The roots of the plants of the grass family help to conserve soil. How?

Let us do



ENRICHMENT ACTIVITIES

H. Class project!

Divide the class into four teams.

Each team should have two different kinds of seeds or seedlings. Each team can then choose a small area to plant these seeds/seedlings.

Observe the seeds/seedlings grow into young plants.

Prepare a scrapbook on the plants.

Describe the parts of the plant—leaves, stem, flowers, etc. of your team's plants.

Draw their pictures in your scrapbook.

I. Adopt a tree.

Make a scrapbook on your adopted tree. Describe its

shape, the texture of its bark (you can make a bark rubbing), the shape of the leaves, its height, and so on.

What is it called? Find out whether it flowers, whether it is deciduous (sheds its leaves annually) or evergreen, and so on.



J. Write a paragraph about rainforests. You can take help from a book from the library or the Internet.

Visit rsgr.in/lsc-4 and click on LINK 3 to get more information about the different animals and plants that live in a rainforest.

K. Visit one of these places if possible.

You can also visit them on the web.

TO VISIT

- ❖ BOTANICAL GARDENS: Bengaluru, Kolkata, Lucknow (Visit rsgr.in/lsc-4 and click on LINK 4 to know more about the Indian Botanical Garden, Kolkata)
- ❖ HILL STATIONS: Srinagar, Mussoorie, Ooty, Mahabaleshwar, Darjeeling (Visit rsgr.in/lsc-4 and click on LINK 5 to know more about some hill stations in India)
- ❖ BEACHES: Goa, Kovalam, Gopalpur

Observe the different types of plants which grow in these places.

A life skill



L. Caring for an indoor plant.

Plants which grow inside our house are called indoor plants.

Check if you know the following:

1. Keep a plate under a pot which has a plant. Why?
2. Water it regularly.
3. Keep it near a window.
4. Remove leaves which turn yellow.
5. Transfer it to the veranda after a few days.



Let us meet



Jagdish Chandra Bose (1858–1937) was a physicist and a biologist. He founded the Bose Research Institute in Calcutta (now Kolkata). He invented the **crescograph**, an instrument which records plant growth. J C Bose proved that, though plants do not have a brain, muscles or a heart, they have small cells which help them to respond to stimuli.



J C Bose

A subject link



(SOCIAL STUDIES)

M. Different trees grow in different regions. Tick (✓) the correct answer to show which type of forest is found in which region.

1. **Evergreen Forests** are mostly found in hot and wet regions.
In India they would be found in Rajasthan / Andaman and Nicobar Island.
2. **Thorn Forests** are mostly found in desert regions.
In India they would be found in Kerala / Rajasthan.
3. **Mountain Forests** are mostly found in high mountainous regions.
In India they would be found in Bihar / Kashmir.
4. **Tidal Forests** are mostly found in deltas of rivers and areas flooded by sea water.
In India they would be found in Madhya Pradesh / Assam.

TEACHER'S NOTES: Discuss about the vegetation of different habitats. Discuss the uses of grass plants. Show things made of grass plants. Specimens of insectivorous plants can be shown to the children.

Check Your Understanding

Enrichment Activities

A. Class project!

Divide the class into four groups. Let each group identify three different types of trees in your neighbourhood. Observe their height, the colour of their leaves, flowers (if any) and the animals that visit them in different seasons. [Remember: birds and insects too are animals.] Prepare a table like this.

	NAME	LEAF COLOUR AND SHAPE	DOES IT HAVE FLOWERS?	ANIMALS WHICH VISIT IT
TREE 1				
TREE 2				
TREE 3				

B. Make a paper doll!

Trace the outline of a doll on a thick card paper and cut it with a pair of scissors. Draw the eyes, nose, mouth and hair.

Draw and cut out some dotted cloth for a summer dress for the doll. Put some lace on the neck and a belt on the dress. Dress the doll. Draw and cut out a winter outfit also.



C. Spring forever!

Make a collage of a spring scene. First draw the outline of your 'spring' sun, trees, flowers, a river on a cardboard. Then use different types of dal, rice, wheat and straw to fill it up. For example, to make the sun, cover the sun area with glue. Sprinkle yellow dal on it. Let it dry. Turn the picture upside down. The extra dal will fall off. Do the same for the other objects.



D. Make a garden in a glass pot!

Take a wide-mouthed glass pot. Place a layer of gravel very gently on the bottom. Add a layer of garden soil. Make small holes in the soil. Now take small indoor plants and plant them. Press the soil around the roots. (If your hand does not go into the pot, use a spoon or fork.) Sprinkle a little water on top. Keep the pot uncovered for 1–2 days. Then cover the pot. Keep the pot indoors where it gets sunlight. A little water can be sprinkled once in a few months.



Half-Yearly Test Paper

(based on Lessons 1 to 7)

A. Tick (✓) the correct answer.

- Sugar and starch are two types of
 - fats.
 - vitamins.
 - carbohydrates.
- A newborn baby has
 - no teeth.
 - milk teeth.
 - temporary teeth.
- We should follow traffic rules to avoid
 - burns.
 - accidents.
 - electric shocks.
- A raincoat is made up of this material.
 - warm
 - cotton
 - waterproof
- Which of the following has fixed shape and volume?
 - liquid
 - solid
 - gas

B. Fill in the blanks.

- There are _____ cracking teeth in each jaw.
- People of Egypt made paper from a grass called _____
- Air is a mixture of _____
- Green leaves are capable of making food because they have _____ in them.
- Trees are tall and straight in _____ areas.

C. Match the columns.

- | | |
|---|-----------------|
| 1. Oil, nuts and butter contain | a. microbes |
| 2. Tiny living things which can be seen only through a microscope are | b. simple sugar |
| 3. This takes the shape of the vessel in which it is kept | c. paper |
| 4. The food prepared by plants is in the form of | d. fats |
| 5. Various kinds of grasses are now used to make different types of | e. liquid |

D. Answer these questions.

- Write five things which help in digesting food.
- Describe different kinds of microbes.
- Write five safety rules you should follow at school.
- Animals and plants depend on each other. Explain.
- Describe adaptations in underwater plants.



Animals: How Life Goes On

AIMS

- To enable the student to
- understand why animals need to reproduce.
 - know the different ways by which different animals reproduce.
 - appreciate the parental care given by most animals to their young ones.
 - observe developmental changes in the life cycle of a cockroach and a butterfly.

AIDS

- CDs on animals, National Geographic films and related websites
- pictures of some animals and their young ones
- charts or specimens of the developmental stages of a cockroach, a butterfly and a mosquito

Living things do not live for ever. They die after completing their **lifespan**. For life to go on, living things must produce more of their own kind. The process by which living beings produce more of their own kinds, is called **reproduction**.

Animals reproduce in two different ways. Some give birth to young ones whereas some lay eggs. Later young ones

hatch out from these eggs. Humans, cats and cows give birth to their young ones. Frogs, hens and snakes lay eggs out of which babies hatch.

SOME ANIMALS GIVE BIRTH TO YOUNG ONES

Mammals

Animals which give birth to young ones



Fig. 8.1 Living things reproduce for life to go on.

LIFESPAN the period of time for which a living thing lives or is expected to live
REPRODUCTION (ree-pro-duck-shun) the process of producing young ones of the same kind

and feed them on their milk are called **mammals**. They are the most developed among all animals. Their bodies are covered with hair. Some examples of mammals are cats, horses, elephants, goats, rabbits and rats. Humans too are mammals. The smallest living mammal is the Kitti's hog-nosed bat. This is about one inch long and weighs about two grams! Though bats fly like birds, they are mammals too. Do you know that whales and dolphins, even though they look like fish and have hairless bodies, are mammals?

Care of the young

Mammals take care of their babies for a long period of time. Usually the mother cares for the young. She feeds the babies, cleans them and keeps them warm. She protects them from enemies. As they grow, the mother teaches them to find food and live on their own.

In certain mammals the father also helps. He hunts for food and guards the young ones. Human beings are the only mammals who look after not only their children but their grandchildren too!

SOME ANIMALS LAY EGGS

Birds

Birds reproduce by laying eggs. Most birds build nests to lay eggs. They sit on the eggs to keep them warm. After some time the eggs hatch and baby birds come out.

The eggs of all birds have a similar internal structure. Each egg has a hard protective outer shell. Within the shell is the egg white called the **albumen**. Within the albumen is the round, yellow **yolk**.

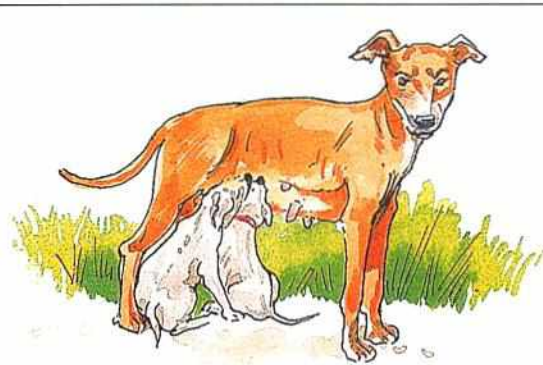


Fig. 8.2 Mammals nourish their babies with milk.



Fig. 8.3 Taking care of the young



Fig. 8.4 Birds reproduce by laying eggs.

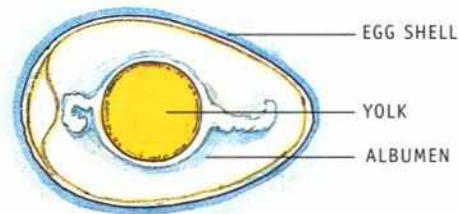


Fig. 8.5 Internal structure of an egg

Figure 8.6 shows the different stages of the development of a chick. The chick is formed and grows inside the yolk.

A growing baby is called an **embryo**. The chick embryo uses the yolk as its food. The embryo develops only if the egg

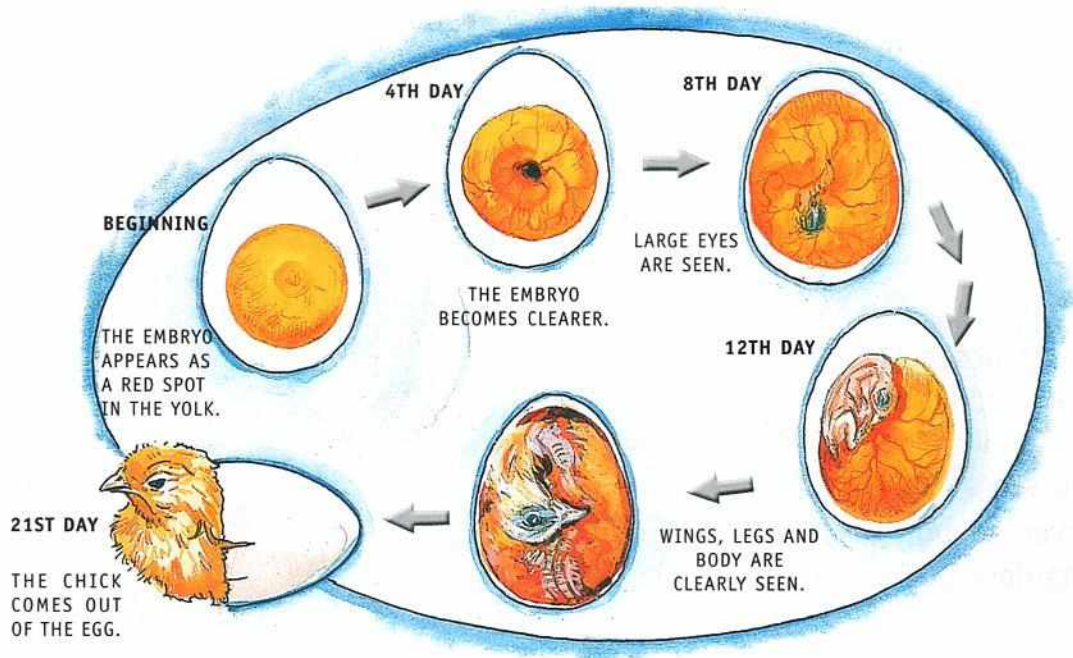


Fig. 8.6 Different stages of the development of a chick

is kept warm. The chick comes out after 21 days.

Oral Questions

Choose the correct answer.

1. Birds / Mammals / Reptiles are the most developed among all animals.
2. The eggs of birds contain a growing baby called the embryo / chick / larva.
3. In a bird's egg the yolk / albumen / shell contains the stored food for the chick.

Other egg-laying animals

Not only birds, but animals like **frogs** and **fishes** too lay eggs. They lay their eggs in water. They care for their babies only for a short time.

A frog's egg develops into a **tadpole**. It keeps growing and slowly changes into an adult frog (Fig. 8.7).

A fish lays thousands of eggs at a time in water. Out of these only a few hundred grow into baby fish. Many eggs and baby fish are eaten up by big fish.

Reptiles like lizards, turtles and snakes lay their eggs in holes in the ground. After laying the eggs some mothers go away and never come back. Many eggs are eaten up by other animals. Some eggs get warmth from the heat of the sun and hatch.

All **insects** hatch from eggs. Some insects like grasshoppers and cockroaches

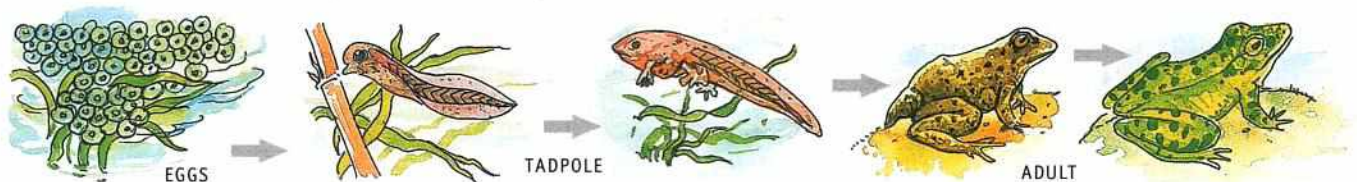


Fig. 8.7 Different stages in the life cycle of a frog

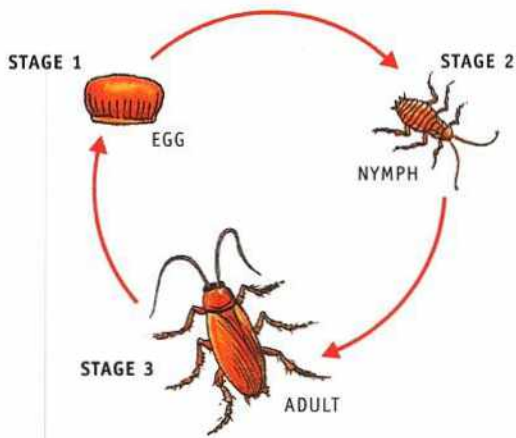


Fig. 8.8 Life cycle of a cockroach

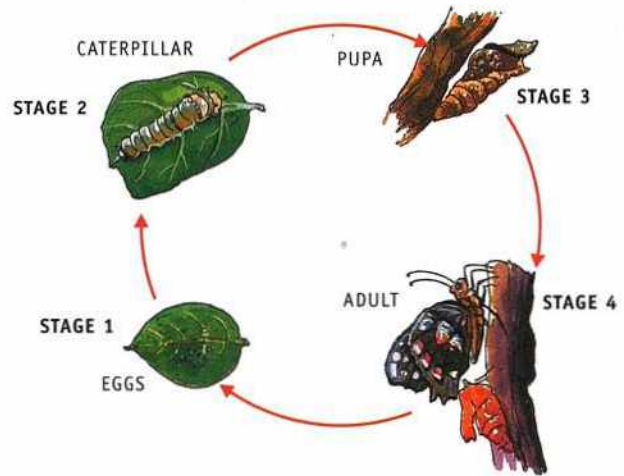


Fig. 8.9 Life cycle of a butterfly

have three stages in their **life cycle**. The baby insect which comes out of the egg is called a **nymph**. It is very similar to the parent. After **moulting** many times, it changes into an adult.

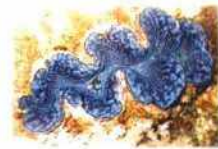
Other insects like houseflies and butterflies have four stages in their **life cycle**. The young one that hatches from the egg of these insects is called a **larva**. It is very different from the parent. It looks more like a worm. The larvae of different insects have different names. The larva of a housefly is called a **maggot**. The larva of a butterfly is called a **caterpillar**. The larva eats leaves and

grows rapidly. After some time it stops eating and forms a covering called a **pupa** around itself. Later the pupa bursts open and the butterfly comes out.





Adult insects do not look after their babies.

IT'S A FACT!

The champion egglayer is the Giant Clam, which lives on the oceanbed. It produces about 100 crore eggs at a time and does this year after year for about 30 years. Can you tell how many eggs it lays during its lifetime?



Let us say it again 

-  Animals need to reproduce so that life on earth goes on.
-  Animals reproduce by giving birth to young ones or by laying eggs.
-  Animals that give birth to young ones and suckle them are called mammals.
-  Some animals give more parental care to their young ones than others do.

NYMPH (nimf)	young one of an insect resembling the adult
MOULTING (mole-ting)	shedding of old skin or shell
LARVA [la(r)-va]	the young one that is different from the adult insect

Let us answer



A. Tick (✓) the correct answer.

- The process of producing young ones is called
 - reproduction.
 - digestion.
 - photosynthesis.
- The yellow portion inside an egg is the
 - yolk.
 - albumen.
 - lemon.
- The young one of a frog is called
 - tadpole.
 - larva.
 - maggot.
- Shedding of old skin by animals is called
 - moulting.
 - changing.
 - reproduction.
- Which of the following is the larva of a housefly?
 - maggot
 - nymph
 - pupa

B. Unscramble the letters to get the names of four egg-laying animals.

zildra _____

nskae _____

ifhs _____

urtlet _____

C. Fill in the blanks with the correct words from the brackets.

- _____ (Mammals / Reptiles) take care of their babies for a long period of time.
- Most birds build _____ (nests / holes) to lay eggs.
- The larva of a butterfly is called _____ (maggot / caterpillar).
- Reptiles like lizards and _____ (snakes / fishes) lay their eggs in holes in the ground.

D. Write short answers.

- How do birds reproduce?
- What are nymphs?
- What are the four stages in the lifecycle of a butterfly?
- Name two insects which have three stages in their lifecycle.

E. Answer these questions.

- What are the different ways by which animals reproduce?
- How do mammals take care of their young ones?
- Why does a fish lay a large number of eggs at a time?



HOTS questions

F. Think and answer.

- A frog can live on land, but its 'babies' cannot. Why?

2. Name an animal that stays in water like fish but has no gills to breathe in water. It gives birth to babies like the tiger does, but does not live in the forest.

G. Understand the relationship as shown and complete the following.

- | | | | | | |
|----------------|---|---------------|---------------|---|------------------------------|
| 1. Cockroach | → | _____ | Frog | → | <u>tadpole</u> |
| 2. Lizard | → | _____ | Goat | → | <u>gives birth to babies</u> |
| 3. Housefly | → | <u>maggot</u> | Butterfly | → | _____ |
| 4. Caterpillar | → | <u>leaves</u> | Embryo in egg | → | _____ |

Let us do



ENRICHMENT ACTIVITIES

H. Observe the lifecycle of a butterfly.

Look on the underside of leaves. The leaves of some plants like the lemon may have tiny eggs on them. They are the eggs of a butterfly. Pluck a few such leaves. Put them in a jar with a wide mouth. Tie a thin muslin cloth over the mouth of the jar. Keep the jar clean and well supplied with fresh lemon leaves. After a day or two, you will see tiny dark caterpillars with white spots. They will eat a lot of fresh lemon leaves every day. When the caterpillars turn green, put a twig in the jar for them to rest on. Very soon, the caterpillars will change into pupae. When a butterfly wriggles out from a pupa, open the jar and keep it out in the sun. Let the butterfly fly out.



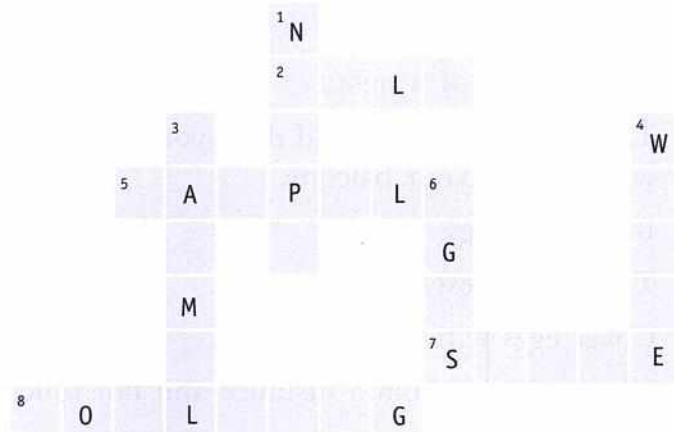
I. Solve the crossword and know the animal world.

ACROSS

- 2 The yellow portion in an egg
 5 Baby frog
 7 Lays eggs in holes in the ground
 8 Shedding of the skin

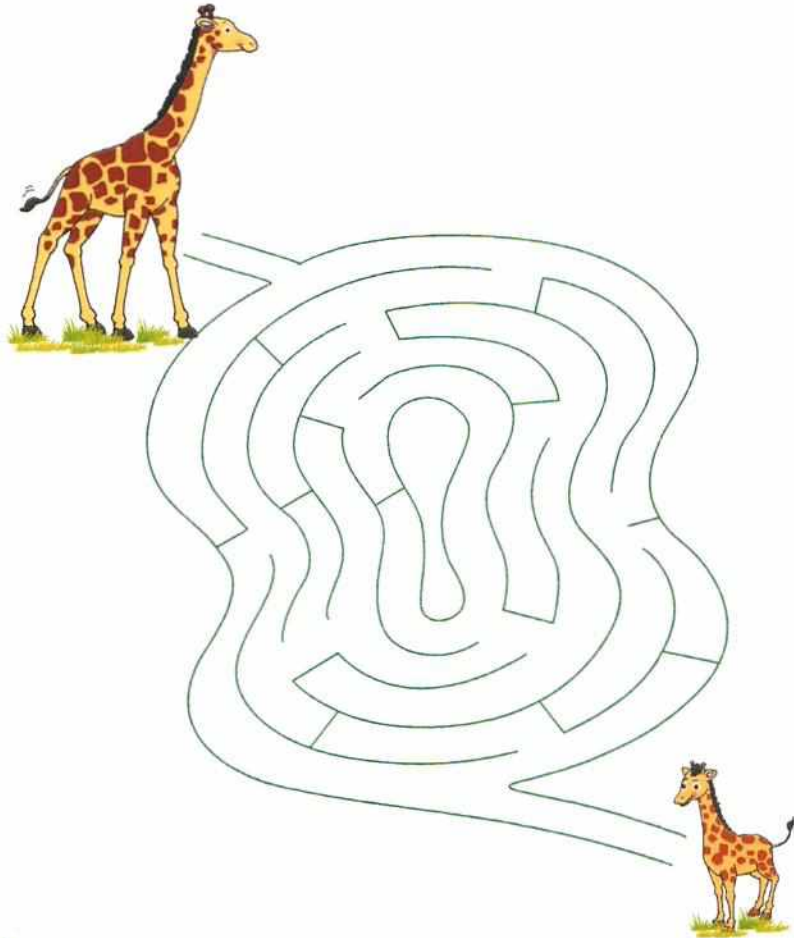
1 Baby insect that looks like the parent

- 3 Man is a _____
 4 Large aquatic mammal
 6 Birds reproduce by laying _____



**D
O
W
N**

J. Giffy, the baby giraffe, has lost his way. Help him to reach Mamma!



K. Visit a pond.

Visit a pond with an adult to see the young ones of frogs and fishes.

TO VISIT

A life skill



L. Taking care of a nest.

Tick (✓) what you would do if you found a nest with eggs in your balcony.

1. Break the eggs.
2. Throw the nest down.
3. Cover eggs with a little grass.
4. Observe them from a distance and not touch them.



TEACHER'S NOTES: Show children pictures and videos of animals and their babies. At home they can observe kittens, puppies and chicks. The rainy season is the best time to look for insects. Teach them not to touch insects but watch them from a safe distance.

Animals: Living and Surviving

AIMS

To enable the student to

- understand the importance of adaptations among animals.
- classify animals according to their habitats and feeding habits.
- identify and enumerate the different ways in which animals protect themselves.

AIDS

- National Geographic and Discovery channel videos
- pictures of birds, fish, leaf insect, stick insect, insects with sting, coloured insects
- pictures of animals with horns, stripes, spots, etc.

Millions of years ago, huge animals called dinosaurs roamed the earth. Now there are no dinosaurs. Do you know why? Some scientists believe this happened due to a sudden change in the earth's climate. They believe that it became very cold and the dinosaurs could not adjust to the cold conditions and died. In the natural world, a plant or an animal adapts or changes itself to suit its surroundings. This happens over hundreds and thousands of years. This process of changing to suit the surroundings is called **adaptation**. Living things that are able to adapt themselves to their surroundings survive. Those that cannot adapt die.

ADAPTATIONS TO ENVIRONMENT

The natural home of an animal is called its **habitat**. Animals can be

grouped according to their habitat.

Terrestrial animals

Animals like horses, lions and camels live on land. They are called **terrestrial animals**. Such animals have legs to move and lungs to breathe. They have well-developed sense organs and a nervous system in order to sense the changes in their surroundings. Animals like snakes do not have legs. They have plates or scales that help them crawl. Animals like polar bears and arctic foxes live in cold regions. They have fur on their bodies to keep them warm. They have fat under the skin to be used as food in winter. The skin of desert animals is thick and not very hairy. It protects them from the heat



ADAPTATION (a-dap-tay-shun) process of changing to suit the environment



A DEER RUNS WITH THE HELP OF ITS LEGS.



A SNAKE CRAWLS WITH THE HELP OF ITS SCALES.

Fig. 9.1 Adaptation for movement among some terrestrial animals



Fig. 9.2 The fur on the skin of a polar bear keeps it warm and helps it to live in cold areas.

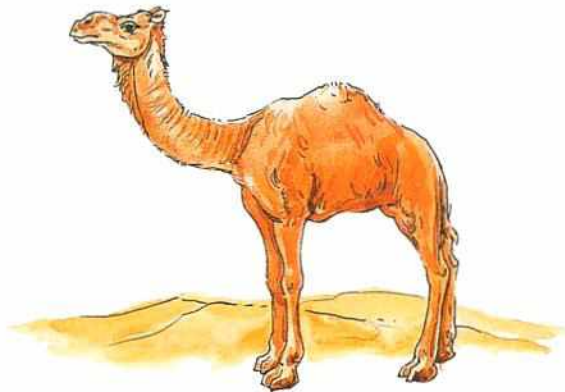


Fig. 9.3 The thick and less hairy skin of a camel protects it from the scorching heat of the desert sun.



THE GILLS IN A CRAB HELP IT TO BREATHE IN WATER.



THE PADDLE-LIKE LIMBS OF A TURTLE HELP IT TO SWIM.

Fig. 9.4 Adaptation among some aquatic animals

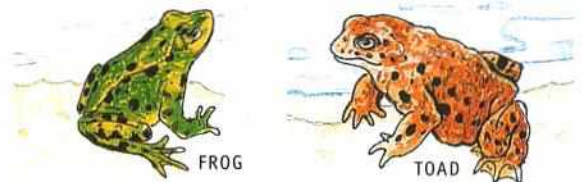
of the sun. Some animals like lizards and frogs sleep for several months to protect themselves from the cold. This is called **hibernation**.

Aquatic animals

Animals that live in water are called **aquatic animals**. Fishes, snails, turtles and crabs are some aquatic animals. Such animals have fins or limbs suited for swimming in water. The webbed feet of a duck and the paddle-like flippers of a turtle help them to push back water while swimming (Fig. 9.4). Fishes and crabs have gills that help them to breathe in water.

Amphibians

Animals that can live both on land and in water are called **amphibians**. Some amphibians are frogs, toads, salamanders and newts. They have limbs that help them in swimming (Fig. 9.5). A moist skin helps them to breathe in water. However, they also have lungs which help them to breathe on land.



FROG

TOAD



SALAMANDER

Fig. 9.5 Amphibians have limbs for swimming, moist skin to breathe in water and lungs to breathe on land.

AMPHIBIAN (am-fi-be-un) animal that lives both on land and in water

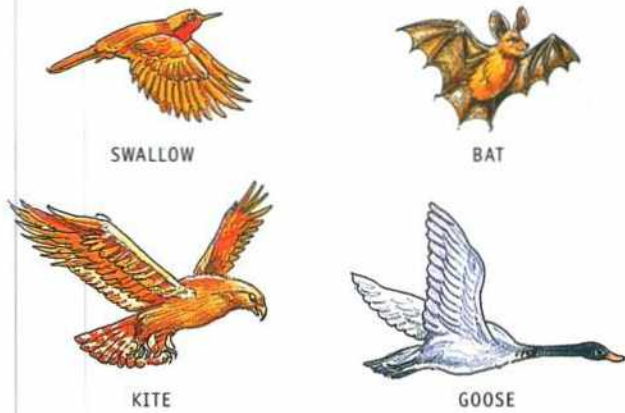


Fig. 9.6 Aerial animals have wings to fly.



Fig. 9.7 Monkey, an arboreal animal, spends most of its time on trees.

Aerial animals

Animals that fly are called **aerial animals**. These animals have wings to fly (Fig. 9.6). Most birds and insects can fly. Bats are the only mammals that can fly. Animals which fly have a light body because of light bones and feathers. The shape of the body is such that it can easily cut through the air.

Arboreal animals

Some animals spend most of their time on trees. They are called **arboreal animals**. Monkeys, tree lizards, flying squirrels and opossums are some arboreal animals. They have claws and broad hip girdles to support their body while climbing. A monkey's long and curly tail helps it to swing from a branch (Fig. 9.7).

ADAPTATIONS FOR FOOD

Animals eat plants or other animals. They can be classified into four groups according to the type of food they eat.

Herbivores

Plant-eating animals are called **herbivores**. Cows, goats and giraffes eat plants. They have sharp biting and strong grinding teeth. They have long and strong legs to travel long distances in search of food.

Carnivores

Flesh-eating animals are called **carnivores**. Lions, tigers and dogs eat the flesh of other animals. They have well-developed

Oral Questions

Choose the correct answer.

1. Polar bears / Camels / Deer live in cold areas.
2. Gills / Lungs / Air holes in fishes help them to breathe in water.
3. Arboreal / Aerial / Aquatic animals fly in the air.

IT'S A FACT!

The sea urchin is just 3 to 10 cm long but can kill a shark! Its body is covered with spiny points. When a shark swallows it, it curls itself into a deadly spiky ball—then bores and eats its way out through the shark's stomach and escapes.

AERIAL (ay-ri-al) ANIMALS	animals that fly in the air most of the time
ARBOREAL (a(r)-bo-real) ANIMALS	animals that spend most of their time on trees
CARNIVORES (ca(r)ni-vores)	animals that eat flesh

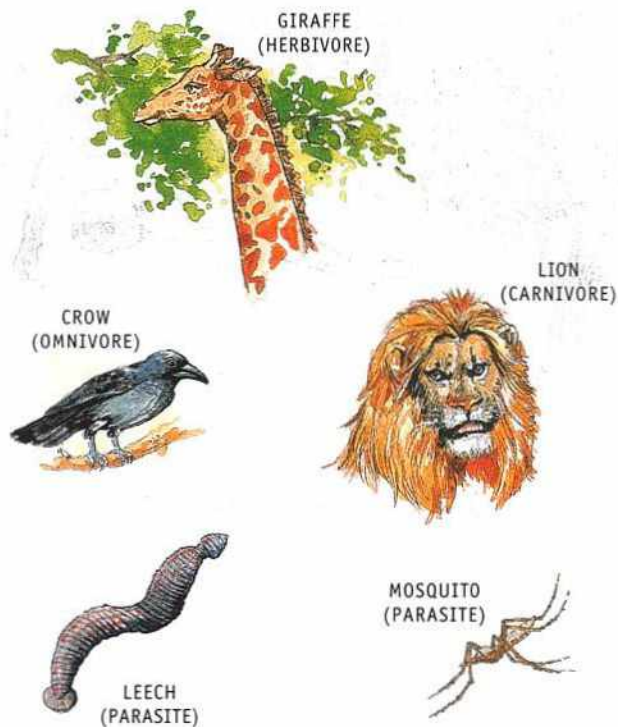


Fig. 9.8 Animals are classified into four groups according to the types of food they eat.

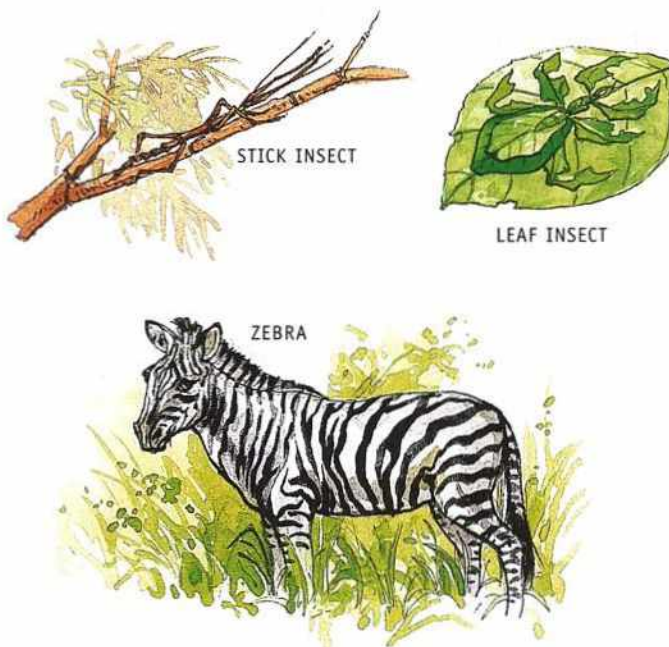


Fig. 9.9 Some animals merge with their surroundings to protect themselves.

tearing teeth. Flesh-eating birds like eagles and vultures have sharp beaks and claws to catch other animals and to tear their flesh.

Omnivores

Animals that eat both plants and animals are called **omnivores**. Bears, crows and cockroaches are some omnivores.

Parasites


Some animals live on or inside the bodies of other animals for their food. They are called **parasites**. The animals on which parasites depend for their food are called hosts. Mosquitoes, leeches, hookworms and bugs are parasites. They have suckers or sucking tubes to suck blood from their host.

ADAPTATIONS FOR PROTECTION

It is very important for animals to protect themselves and live long enough to reproduce. Let us read about the three most common ways by which animals save themselves from being eaten up by other animals.

- 🐟 Fishes, houseflies and frogs **move fast enough** to escape from their enemies.
- 🐳 Whales, elephants and hippos are **too big to be eaten** by other animals.
- 🦓 Zebras, tigers and leopards have stripes or spots on their bodies which help them to **merge or mix with their surroundings**. This is called **camouflage**.





OMNIVORES (om-ni-vores) animals that eat both plants and flesh
PARASITES (pa-ra-sa-eats) animals living on or inside the bodies of other animals

 In polar regions, arctic foxes have brown coats in summer but grow white fur in winter. Their colour merges with their surroundings and it becomes difficult to spot them. Thus, they keep themselves safe from their enemies. Insects like the stick insect and the leaf insect look like what their names suggest! And that keeps them safe.

IT'S A FACT!

The sabre-toothed tigers lived on this earth many years ago. They were so called as they had sabres, i.e. two long pointed blade-like canine teeth in their upper jaw. These tigers stopped existing about 10,000 years ago. However, the reason for their extinction is unknown. Some say their prey disappeared while others say the climate changes were unsuitable for them so they became extinct.

Let us say it again

-  In the natural world, a plant or an animal adapts or changes itself to suit its surroundings.
-  Animals can be grouped according to their habitat as a. terrestrial, b. aquatic, c. amphibian, d. aerial, and e. arboreal.
-  Animals can be grouped as herbivores, carnivores, omnivores and parasites according to their food habits.
-  Fast movement, large size and merging with the surroundings are three common ways by which animals protect themselves from their enemies.

Let us answer

A. Tick (✓) the correct answer.

1. It is a term used when an animal sleeps for several months to protect itself from cold.
a. hibernation b. respiration c. extinction d. digestion
2. The natural home of an animal is called its
a. house. b. nest. c. habitat. d. water.
3. Terrestrial animals breathe through
a. air holes. b. gills. c. lungs. d. scales.
4. Monkeys are called
a. terrestrial animals. b. aerial animals. c. arboreal animals. d. aquatic animals.
5. Carnivorous animals have well-developed
a. biting teeth. b. tearing teeth. c. chewing teeth. d. grinding teeth.

6. This adaptation helps animals to protect themselves.
 - a. big nose
 - b. slow movement
 - c. small eye
 - d. camouflage
7. He is a wildlife conservationist.
 - a. Sunderlal Bahuguna
 - b. Baba Amte
 - c. Steve Irwin
 - d. Sunita Williams

B. Write T for True or F for False.

1. A snake crawls on its legs.
2. Animals that live both in water and on land are called amphibians.
3. Animals that spend most of their time on trees are called aquatic.
4. A giraffe is an omnivore.
5. Animals that live on or inside the body of other animals are called parasites.

C. Complete the table with suitable statements.

	TERRESTRIAL	AQUATIC	AMPHIBIAN	AERIAL	ARBOREAL
MOVEMENT	legs to move on land				
BREATHING ORGANS			moist skin (to breathe in water) lungs (to breathe on land)		
EXAMPLES					

D. Write short answers.

1. What is adaptation?
2. How do animals living in cold regions keep themselves warm?
3. What are arboreal animals?
4. Why do most herbivores have long and strong legs?



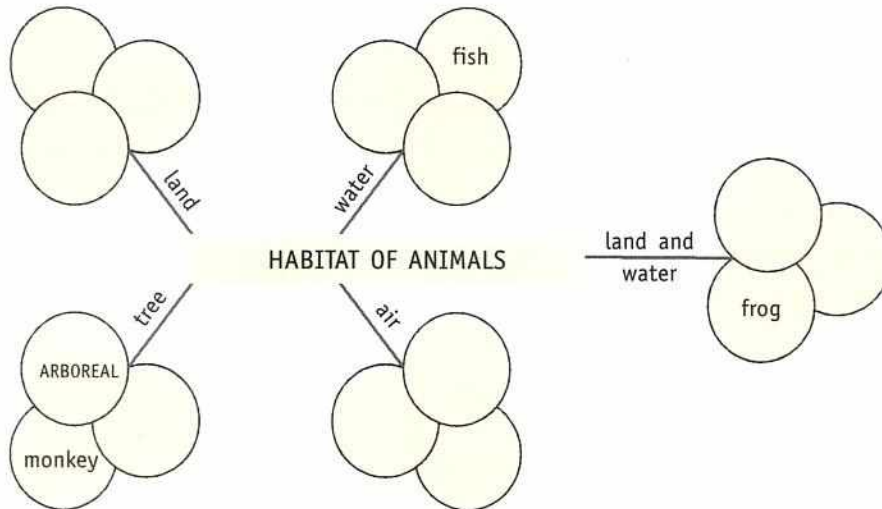
E. Answer these questions.

1. The frog is an amphibian. How is it adapted to live on land and in water?
2. Why do aerial animals have light bodies?
3. What are the different ways by which animals protect themselves?
4. How do animals like fish, elephant and leaf insect protect themselves?

HOTS questions

F. Think and answer.

- Birds are winged creatures. An ostrich cannot fly in spite of having wings. Why?
- Think and fill in the correct words in the circles. You may fill in the names or draw or paste pictures of animals.



Let us do



ENRICHMENT ACTIVITIES

G. Circle the odd one out.

- | | | | |
|-------------|---------|------------|-------------|
| 1. lion | leopard | elephant | wolf |
| 2. fish | turtle | dolphin | grasshopper |
| 3. mosquito | rabbit | tapeworm | leech |
| 4. frog | toad | salamander | bat |

H. Giant Panda Club!

The Giant Panda is an endangered animal. It was saved from dying after many efforts. Visit rsgr.in/lsc-4 and click on LINK 6 and LINK 7 to find out more about endangered animals. Make a project on the Giant Panda. Find out also about how the efforts required to save the Giant Panda are different from the efforts required to save other animals from extinction.



GIANT PANDA

I. That's a lie really!

People hold many wrong notions about animals. You'd better not believe them. Here are some truths.

- Mice love cheese.** While Mickey Mouse and Jerry and other mice in stories might find cheese a super treat, real mice do not. They like seeds, nuts and vegetables.

2. **Bats are blind.** They are not. However, they hardly use their eyes. They depend on their ears to help them move! And this is why they can fly in the dark.
3. **Owls are blind during the day.** Owls can probably see better than us in daylight and they can't see at all when it is pitch dark. The only difference is, they can see better in dim light.
4. **Camels store water in their humps.** The hump is not a water bottle! Camels store fat in their humps. So, when they can't get food or water, they use the fat which has some liquid too.
5. **Centipedes have a hundred legs.** Though 'centi' means hundred and 'pede' means feet, most centipedes have less than 50 legs, though there are some which might have 200!



J. Visit a zoo or a wildlife park.

TO VISIT

Visit a zoo or a wildlife park. Now divide the class into four groups. Each group will make a chart on different types of animals, for example, arboreal, aerial, aquatic and terrestrial.

Let us meet

Steve Irwin (1962–2006) All animal lovers are familiar with him. As a television personality, naturalist, zoologist, conservationist, he achieved world-wide fame from his television programme—**The Crocodile Hunter**—an internationally broadcast wildlife documentary series, co-hosted with his wife Terri Irwin. He died in 2006 after being fatally pierced in the chest by a stingray barb.



STEVE IRWIN

A subject link

(SOCIAL STUDIES)

K. Try to remember all the stories you have read. Now name these famous story animals.

1. My name is Bagheera. I am Mowgli's friend. I am a _____
2. My name is Black Beauty. I have a white star on my forehead. I am a _____
3. My name is Buck. I am the hero of a book titled 'Call of the Wild'.
I am a _____
4. My name is Moby Dick. My book has the same name. I am a water animal.
I am a _____

TEACHER'S NOTES: Encourage children to watch National Geographic, Animal Planet or Discovery Channel Videos to learn about the natural surroundings and eating habits of animals. Children can paste pictures of animals in their notebook classifying them according to their surroundings and food habits. Get information about two animals that are extinct.

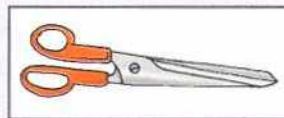
Force, Work and Energy

AIMS

- To enable the student to
- ➔ list the types of forces and understand their applications.
 - ➔ understand and give examples of work done.
 - ➔ know what energy is, and name its forms and uses.
 - ➔ prepare exhibits of improvised simple appliances that make work easier.

AIDS

- a film clip or video on machines at work
- simple machines like a bottle-opener, can-opener, scissors
- pulley, inclined plane, screw
- catapult



FORCE

You must have seen a cricket match. The bowler uses force to bowl. The batsman uses force to hit the ball. The fielder uses force to stop it. These are three ways in which the cricketers use force. Force is used to

- a. move a body (the ball in this case)
- b. stop a moving body and
- c. change the direction of the moving body.

Force can be used to push or pull something. We apply force to push the pedals of a bicycle to make it move. Similarly, we use force to press the brakes to stop it.

Types of force

There are different types of force (Fig. 10.1).

The force exerted by the muscles of our body is called **muscular force**. Various tools use **mechanical force** to do work. **Elastic force** is used to move a catapult. The force by which the earth pulls an object towards it is called **gravitational force**. A moving body slows down or stops on its own due to **frictional force**.

WORK

When we use force on an object and the object moves through a distance, we say that **work** is done on the object.

According to science, we do not do any work if we stand at a place with a load on our head, even for a whole day because there is no movement of the

FORCE a push or a pull that makes a body move or stop moving

WORK when force is applied on a body to make it move through a distance

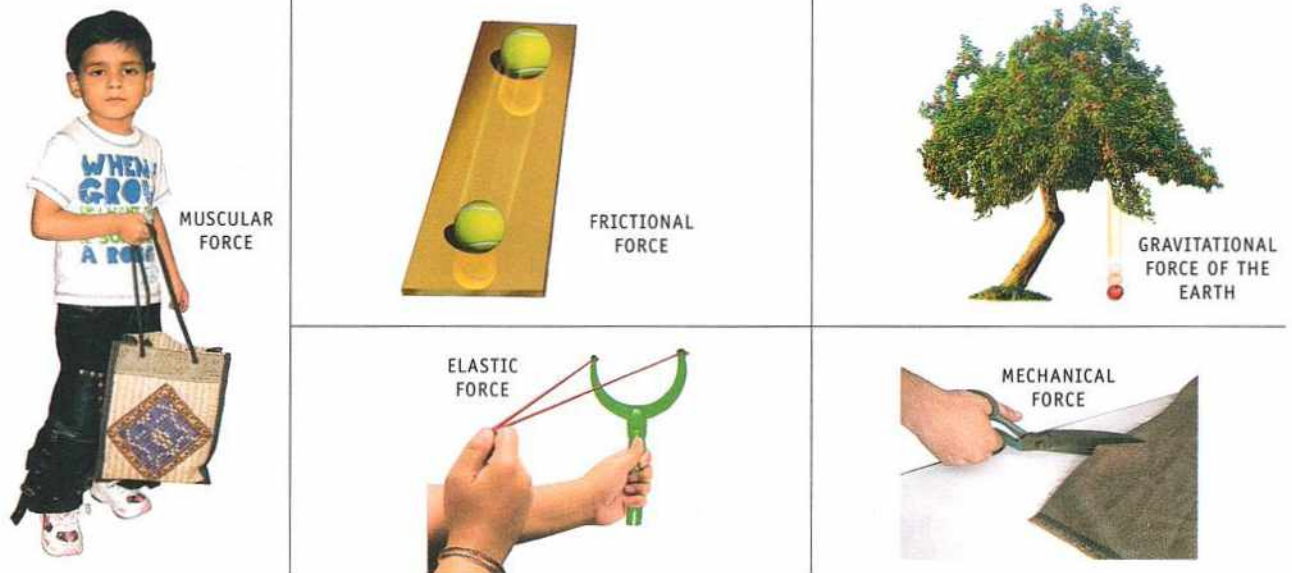


Fig. 10.1 Different types of force

load. Work is done when a load is lifted, when a door is opened, when a nut is cracked or when a flag is hoisted.

Work done can be calculated by the following formula:

$$\text{Work done} = \text{Force applied on an object} \times \text{Distance moved by the object}$$

SIMPLE MACHINES

Often we have to use some tools to do some work. Such tools are called **simple machines**. For example, we use a knife to cut an apple. Here, knife is a tool or a

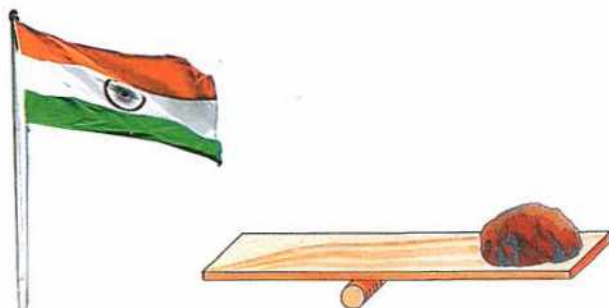


Fig. 10.2 Work is done when a flag is hoisted and a load is lifted.

simple machine. Simple machines help us to

- ☛ do our work faster and with less effort,
- ☛ change the direction of force used, and
- ☛ do work with less force.

Some examples of simple machines are the **lever**, the **pulley**, the **wheel and axle**, the **inclined plane**, the **screw** and the **wedge**.

Lever

A lever is used to lift weights, cut things and open lids. Scissors and bottle-openers are examples of levers. A small child lifts up a heavier child on a see-saw which is also a type of lever.

Pulley

A pulley is made from a wheel and a rope. It is used to lift things easily. Villagers use pulleys to draw water from wells.

Wheel and axle

A wheel-and-axle arrangement is made up

MACHINE (m(a)-sheen) a tool that makes work easy

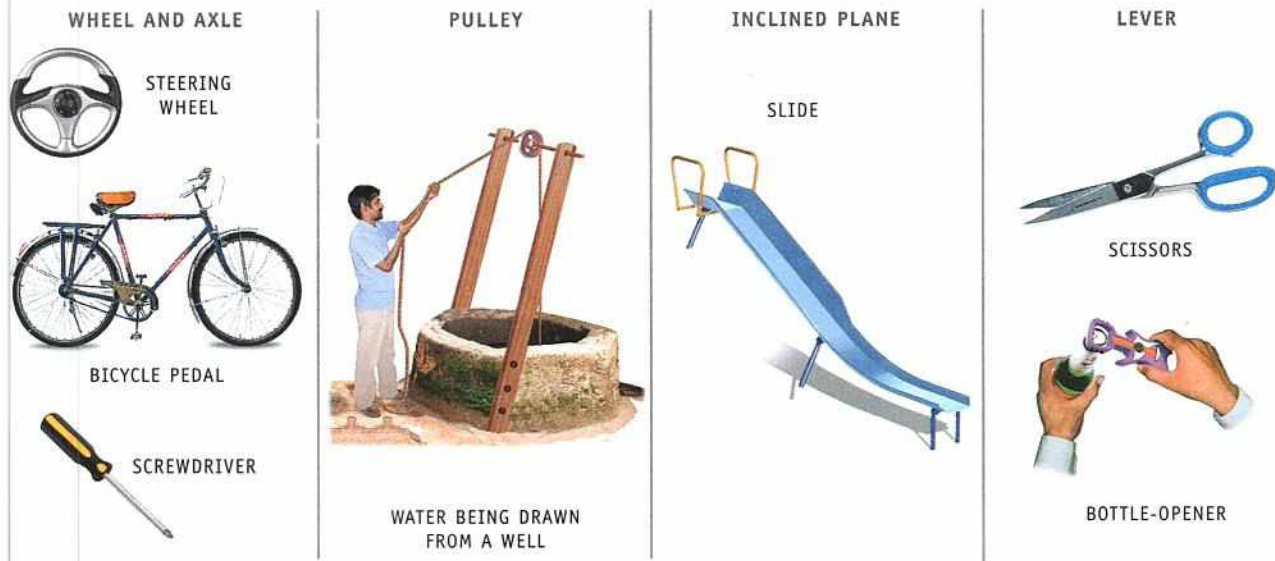


Fig. 10.3 Some examples of simple machines

of two circular objects of different sizes. The **wheel** is the larger object. It rotates around the smaller circular object called **axle**. A steering wheel, a bicycle pedal and a screwdriver are some examples of wheel and axle.

Inclined plane

An inclined plane is simply a slope over

ACTIVITY 1 Take a sheet of paper. Cut a right-angled triangle from it to form an inclined plane. Colour the inclined edge. Now wrap the paper around a pencil as shown in Figure 10.4. The coloured inclined edge forms the grooves of a screw.

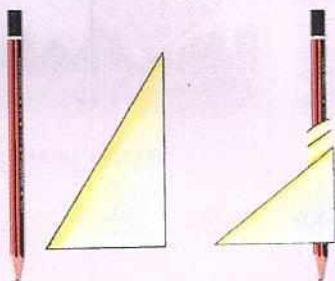


Fig. 10.4 A screw is an inclined plane wound around a rod.

which a load can be pushed up or down. A plank of wood is often used to load heavy barrels onto trucks.

Screw

A screw looks like a nail with grooves cut into it. It is used to hold things together.

Wedge

Observe a knife or a woodcutter's axe. Note that the edges are sharp in front and blunt at the back. They are shaped like two inclined planes attached back to

Oral Questions

Choose the correct answer.

1. Elastic / Gravitational / Frictional force is used to move a catapult.
2. Lever / Pulley / Screw is made from a wheel and a rope.
3. A bicycle pedal / nutcracker / wedge is an example of wheel and axle.
4. A screw / wedge / pulley is a machine which looks like a nail with grooves cut into it.

back. This structure is called a **wedge**. It is used to cut hard objects.

ENERGY

Energy is the ability to do work. Energy is needed for everything you do—laugh, eat, play, breathe, and so on. All living things need energy to live.

Sources of energy

Most of our energy comes from the **sun** directly or indirectly. Green plants trap the sun's energy to make food. Man and other animals eat food and use this energy to do work and to stay alive. The **atom** and the **hot interior of the earth** are two other important sources of energy.

Solar energy

Have you seen a solar cooker or a solar heater? What is their source of energy? The sun. The energy that we get from the sun is called **solar energy**. This solar energy can be changed into heat energy,

light energy and electrical energy.

Fuels like coal, oil and wood have chemical energy. This chemical energy is converted into heat and light energy on burning of these fuels.

Atomic energy

An atom is the smallest particle of matter. **Atomic energy** comes from the splitting of an atom. Atomic energy should be used for mankind. For example, atomic energy is used for producing electricity. However, weapons like atom bombs, which can kill lakhs of people, have also been made and used.

Geothermal energy

The hot interior of the earth is another important source of energy. This energy is called **geothermal energy**.

Wind and water energy

We also get energy from water and from wind. This energy is mainly used to



HYDRO ENERGY TO PRODUCE ELECTRICITY



HEAT ENERGY TO MOVE ENGINE



TRAPPING SOLAR ENERGY

Fig. 10.5 We use different forms of energy in our daily life.

ENERGY	the ability to do work
SOLAR ENERGY	energy from the sun
GEOTHERMAL (jee-o-the(r)mul) ENERGY	energy from the hot interior of the earth

IT'S A FACT!

Water is sometimes drawn up from a river, to irrigate fields, with a device called an Archimedes' screw. Each time the screw turns, it lifts the water a little inside a tube. This device was invented by Archimedes nearly 2200 years ago to pump out water from a large ship.

generate electricity. Energy from natural sources like the sun, though limitless, should not be wasted.

Different forms of energy






We use different forms of energy in our

daily life. Energy can be changed from one form to another.

Where does a car get the energy to move? This energy is provided by the fuel we fill in the car. When we beat a drum our muscular energy is changed into sound energy.

In loudspeakers sound energy is changed to electrical energy and then this electrical energy is changed into sound energy. In electric motors electrical energy is changed into mechanical energy. Can you think of more such examples?

Let us say it again

-  Force can move a body, stop a moving body and change the direction of a moving body.
-  Force is applied to push or pull something.
-  Work is done when force moves an object through a certain distance.
-  Work is made easier by using tools. These tools are called simple machines.
-  Energy is the ability to do work.

Let us answer

A. Tick (✓) the correct answer.

1. A moving body slows down or stops on its own due to this force.
a. gravitational b. elastic c. mechanical d. frictional
2. This is used to open lids.
a. pulley b. lever c. wheel and axle d. inclined plane
3. Tools make work
a. hard. b. easy. c. soft. d. complex.
4. This energy comes from the splitting of an atom.
a. atomic b. solar c. geothermal d. wind
5. In electronic motors electrical energy is changed into this energy.
a. mechanical b. solar c. wind d. atomic

B. Write short answers.

1. Name five different sources of energy.
2. Write the name of the force exerted by the muscles of our body.
3. What is gravitational force?
4. What are simple machines?
5. Name five simple machines.



C. Answer these questions.

1. What are the different forms of energy into which solar energy can be changed?
2. Write a short note on atomic energy.
3. What is geothermal energy?
4. How do simple machines help us?
5. Write two machines being used at home in which one form of energy is changed into another.

HOTS questions

D. Think and answer.

1. Which action would need more physical energy?
 - a. riding a bicycle on a level road
OR
riding a bicycle up a hill
 - b. walking on the road
OR
jogging in the park
 - c. doing your homework
OR
playing football



E. Name the kind of force being used in each case. There might be more than one type in some cases.

1. Arun bowled the fifth ball of the over. Ajay hit it to the boundary for a four.
2. The doorbell rang. Stella ran to the door.
3. The cup fell from Shaan's hands and broke into pieces.
4. The stone rolled down the slope and fell into the river.
5. Ali dropped the bat. It fell on the floor with a thud.
6. Granny cut a piece of cloth into two with a pair of scissors.

Let us do



F. Find some words related to work, force and energy in this wordsearch.



ENRICHMENT ACTIVITIES

T	P	F	O	R	C	E	P
W	O	R	K	L	O	A	Q
E	T	I	L	E	V	E	R
D	P	C	S	C	R	E	W
G	A	T	O	M	I	C	P
E	X	I	L	T	P	O	U
T	L	O	A	S	U	N	L
P	E	N	R	W	E	L	L
G	R	A	V	I	T	Y	E
T	P	E	N	E	R	G	Y

G. Make charts.

Divide the class into four teams.

TEAM 1 finds out about solar energy and makes charts on its uses.

TEAM 2 finds out about wind energy and makes charts on its uses.

TEAM 3 finds out about geothermal energy and makes charts on its uses.

TEAM 4 finds out about energy from water and makes charts on its uses.

Now organize a class exhibition.

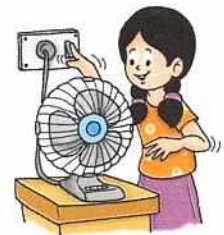
A life skill



H. Saving energy!

Find out how much energy is being used in your house. Count the number of electrical gadgets in your house. Check in your house and tick (✓) the following.

1. Do you switch off the lights and fans before leaving the house?
2. Do you use CFL bulbs and tubelights?
3. Do you get enough sunlight in your room?
4. Do you open your refrigerator door too often?
5. Do your family members watch television in a common room?



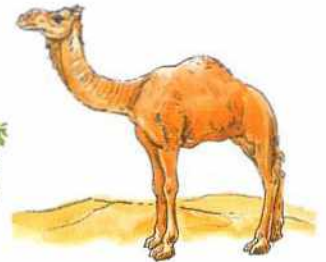
TEACHER'S NOTES: Take the children to the playground. Ask them to observe other children playing—force used and work done. Display some simple appliances in the class while teaching simple machines, like a sharpener to sharpen a pencil. Discuss the reasons for using solar energy extensively.

Check Your Understanding

Enrichment Activities

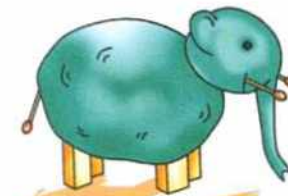
A. From the statements 1 to 10, check the ones which are true for the animal shown below. Then write the correct number below the picture.

1. I have gills to breathe.
2. I love to stay on trees.
3. I can live both on land and in water.
4. I can stay without water for many days.
5. I have a light body so that I can fly.
6. My body shape allows me to cut through air.
7. I have thick skin to protect myself from the sun.
8. My claws are such that they help me in climbing a tree.
9. I have fins to swim in water.
10. I can breathe not only through lungs but through my skin as well.



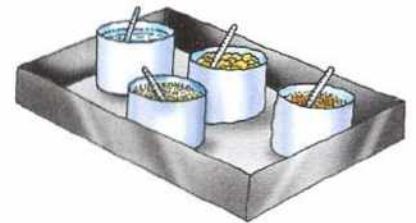
B. Make plasticine animals.

Make an elephant, a snake, and a bird. Arrange them in a tray. Decorate your tray with paper or plasticine trees and grass. Instead of plasticine you can also do this activity with flour (atta).



C. By the power of the sun

Take the lid of an empty cardboard box and use it as a tray. Paint it black and keep it out in the sun. Take four empty tins. Fill one tin with sand, the second with water, the third with cotton wool and the fourth with small pieces of thermocol. Place all the tins in the 'tray'. After an hour, bring the tray indoors and push a thermometer into each tin. Keep a record of the temperature every two minutes. Which material loses heat the most?



The Earth and Its Neighbours

AIMS

- To enable the student to
- distinguish between stars, planets and satellites.
 - differentiate between the rotation and the revolution of the earth.
 - make models of the solar system.
 - understand how seasons are caused.

AIDS

- an educational CD or a video film about the universe
- a globe
- picture or model of the solar system
- plastic or rubber balls of different sizes

THE SKY

The sky is full of heavenly objects. Some of them are brighter than others. The tiny specks of light that appear in the sky are called **stars**. The slow-moving bright bodies are called **planets**.

STARS

A star is a huge ball of gases. It gives out light and heat. The sun is a star. It is the star nearest to the earth. Some stars are smaller than the sun. Some are a thousand times bigger than it. Stars shine for millions of years. Many patterns of stars are visible in the sky. We call these patterns **constellations**.

The stars we see in the night sky are only a part of a huge star cloud. This star cloud is called the **Milky Way galaxy**

which has billions of stars. Milky Way is a spiral-shaped galaxy.

There are billions of galaxies in the universe. Can you imagine how big our universe is!

PLANETS

The earth on which we live is a planet. It does not have light or heat of its own.



Fig. 11.1 The earth on which we live is a planet.

STAR a heavenly body having its own heat and light

PLANET (PLAN-ET) a heavenly body with no heat or light of its own

However, when the sun's light falls upon the earth it shines. A planet is much smaller in size than a star.

The earth is one of the eight planets that move in their orbits around the sun. Five have been known to man for a long time. They are **Mercury, Venus, Mars, Jupiter** and **Saturn**. The others, namely **Uranus** and **Neptune** were discovered after the invention of the telescope. Earlier, we thought there were nine planets. Pluto was the ninth planet. However, Pluto is no longer considered a planet. It was called a dwarf planet in 2006 and then a plutoid in June 2008. The planets were named after the gods and goddesses of Greece and Rome. Mars, for example, was the Roman god of war.

When you look at the stars, try to look for the planets among them. You can easily spot at least two or three of them.

IT'S A FACT!

Venus is covered with thick, white clouds. The clouds trap the heat of the sun. So, the surface of Venus is very hot. The rocks are hotter than boiling water!

Mars looks different from the others as it is reddish in colour.

Mercury and Venus are seen in the morning and evening. Venus is called the **morning** or the **evening star**. Jupiter is bright and is the largest of all planets. Saturn is not so bright. It has a system of rings around it. The planets that are further away can be seen only with the help of a telescope.

SATELLITES

Satellites are small heavenly bodies that revolve around planets. Some planets have their own satellites. The moon is a natural satellite of the earth.

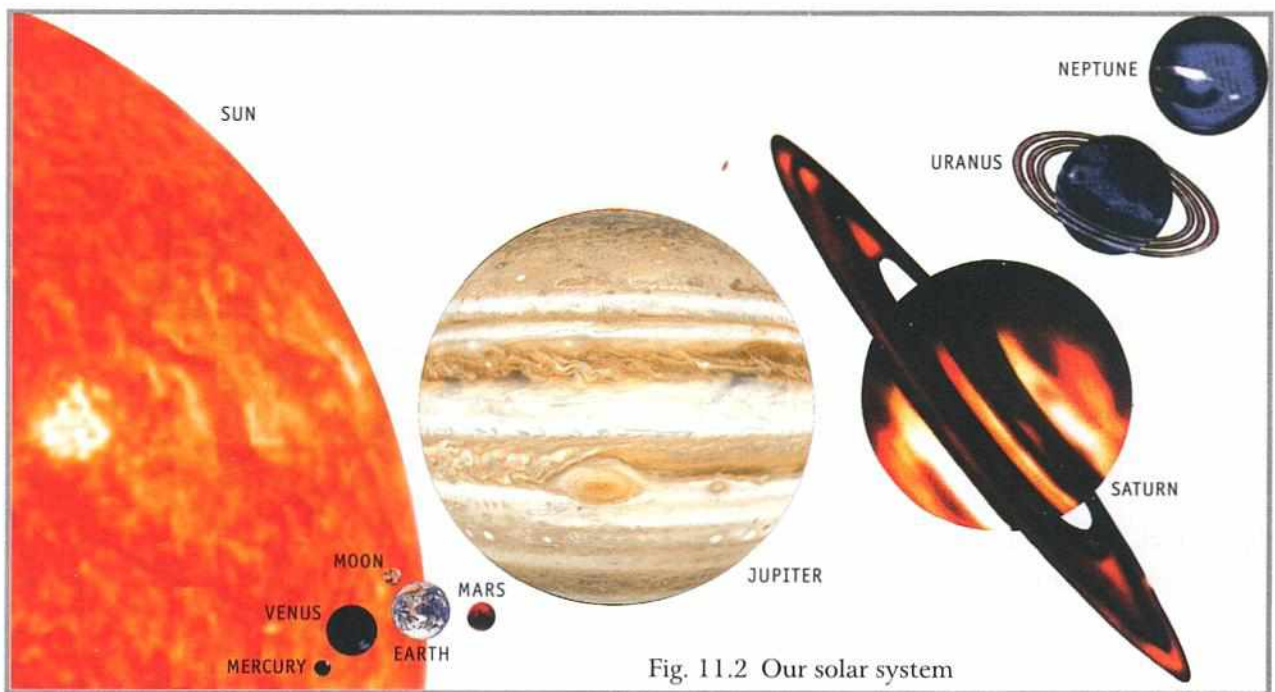


Fig. 11.2 Our solar system



MERCURY



VENUS

More About Planets



EARTH

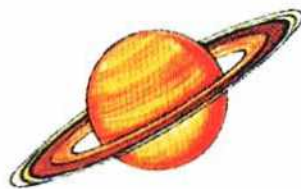


MARS

NAME OF PLANET	INDIAN NAME	ORDER ACC. TO DISTANCE FROM SUN	NO. OF MOONS	INTERESTING FACTS
Mercury	<i>Budh</i>	first	0	<ul style="list-style-type: none"> Boiling hot by day and freezing cold at night
Venus	<i>Shukra</i>	second	0	<ul style="list-style-type: none"> Brightest planet Called morning star or evening star as it is seen at dawn or dusk
Earth	<i>Prithvi</i>	third	1	<ul style="list-style-type: none"> Only planet that supports life
Mars	<i>Mangal</i>	fourth	2	<ul style="list-style-type: none"> Covered with red dust; appears red in night sky. Thus, it is called the red planet. Its name comes from Mars, the Roman God of War.
Jupiter	<i>Brihaspati</i>	fifth	79	<ul style="list-style-type: none"> Largest and fastest spinning planet Weighs more than 318 earths put together Wider than 11 earths side by side
Saturn	<i>Shani</i>	sixth	82	<ul style="list-style-type: none"> Its rings are made up of ice, rocks & dust
Uranus	<i>Arun</i>	seventh	27	<ul style="list-style-type: none"> Covered with a thick layer of beautiful blue-green gas
Neptune	<i>Varun</i>	eighth	14	<ul style="list-style-type: none"> Has cold winds that blow at a speed greater than that of a flying plane



JUPITER



SATURN



URANUS



NEPTUNE

SOLAR SYSTEM

The sun and the eight planets revolving around it along with their satellites make up the **solar system**.

OUR PLANET EARTH

The earth is a beautiful planet. It has land and water, mountains and valleys, hills and plains. It has flowers and plants, animals and people. However, it has not always been like this. It was born as a huge ball of dust and hot gases. The ball kept on spinning. As it spun, its outer surface grew cold and hard. Some gases escaped while some were trapped inside. Today the earth is like a half-boiled egg! Its outer surface is hard, but, deep inside, it has hot, molten material. The outer surface is called the **crust**. The inside portion is called the **core**. Between the outer crust and the inner core, there are layers of rocks, minerals and metals in solid form. This layer is called the **mantle**.

Today, even after millions of years, the core has an extremely high temperature and

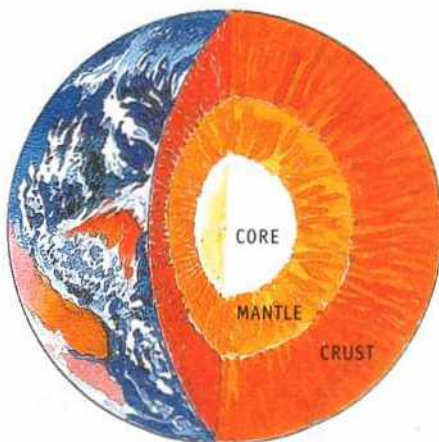


Fig. 11.3 The layers of the earth



Fig. 11.4 An active volcano

is under great pressure. The boiling liquids and gases of the core push against the outer crust. The weak spots of the earth crack open under this pressure, letting the hot boiling liquids and gases gush out. This is how a **volcano** is formed.

An **active volcano** is one which erupts regularly. A **dormant volcano** is one which has not erupted for a long time. A volcano is said to be **extinct** if it has not erupted during recorded history.

Movements of the earth

The earth moves on its axis. The axis of the earth is an imaginary line that runs through the centre of the earth. This axis is slightly tilted. The two points where the axis seems to enter are called the **poles**: the **North Pole** and the **South Pole**.

The **equator** is another imaginary line around the earth, exactly halfway between the poles. It divides the earth into two equal halves, the **Northern Hemisphere** and the **Southern Hemisphere**. The movement of the earth on its axis is called **rotation**. Besides rotating on its

HEMISPHERE (hem-is-fea(r)) one half of a sphere, here, the earth
ROTATION (ro-tay-shun) spinning of the earth on its axis

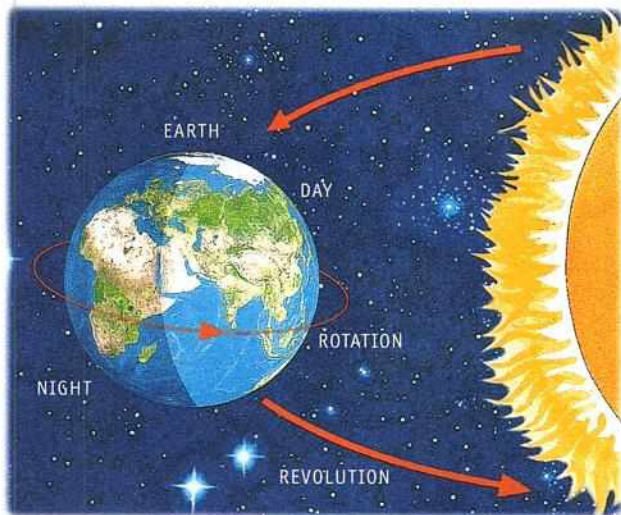


Fig. 11.5 Earth rotates on its axis as it revolves around the sun. The rotation causes day and night. The revolution causes change in seasons.

axis, the earth also revolves around the sun. This movement of the earth around the sun is called **revolution**. The earth moves continuously. It revolves around the sun in a fixed path called an **orbit**. One revolution is completed in about $365\frac{1}{4}$ days. This time period is called a **solar year**.

Oral Questions

Choose the correct answer.

1. A planet / star / moon is a huge ball of gases that has heat and light of its own.
2. Satellites are small heavenly bodies that revolve around the planets / stars / sun.
3. The outer surface of the earth is called crust / mantle / core.
4. The movement of the earth around the sun is called rotation / revolution / gravitation.

SEASONS OF THE EARTH

As the earth orbits around the sun, the

longer days of summer change into the shorter days of winter. This means that the length and temperature of the days change. This causes the seasons: **spring, summer, autumn** and **winter**. The axis of the earth is tilted at an angle. This is why when the Northern Hemisphere is away from the sun, the Southern Hemisphere is towards it. Again the Southern Hemisphere is away from the sun when the Northern Hemisphere is towards it. So, the season in the Northern Hemisphere can never be the same as the season in the Southern Hemisphere.

How are seasons formed?

What happens when the earth goes around the sun?

- ☀ **When the North Pole is towards the sun** (Fig. 11.6) it is summer in the Northern Hemisphere. The days seem to be hotter because the sun's rays fall directly. At the North Pole there is sunlight for most of the day and some part of the evening. During this time the South Pole is turned away from the sun. So, the sun's rays do not reach the South Pole and there is not much daylight. It is winter in the Southern Hemisphere.
- ☀ **When the North Pole is turned away from the sun** (Fig. 11.6), it is winter in the Northern Hemisphere. The days are shorter and the sun seems low in the sky. Now it is summer in the Southern Hemisphere.

REVOLUTION (rev-o-lew-shun)

movement of the earth around the sun

SOLAR YEAR

the time taken by the earth to orbit around the sun once

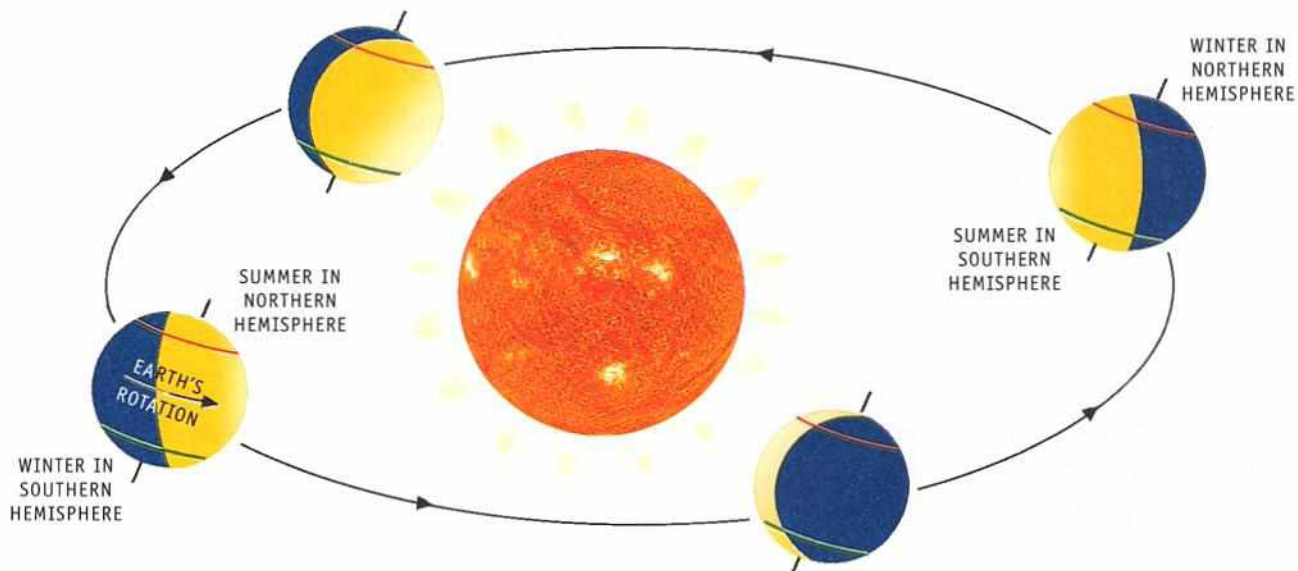


Fig. 11.6 The revolution of earth around the sun causes seasons.

Look at the region near the equator. This part gets almost the same amount of sunlight all the year round. It is like summer throughout the year. Days and nights are of about 12 hours each. If the axis of the earth was not tilted, the distance of the South Pole and the North Pole from the sun would have been the same. Both the hemispheres would have received the same amount of heat. There would have been no change of seasons. So, the two factors which cause seasons are 1. the tilted axis of the earth, and 2. the revolution of the earth.

FESTIVALS AND THE HEAVENLY BODIES

You must have seen in your school diary and calendars that the holiday for *Eid* is marked with 'Depending on the appearance of the moon'. This is because the Islamic calendar is based on the phases of the moon. Many other Indian festivals too are linked to the movement of the moon, the planets, the sun and the seasons. Holi marks the coming of spring. Baisakhi, Onam, Pongal, Bihu and Lohri are linked to the seasons. The days of the week in the Indian calendar are named after the planets. For example, Shanivaar means the day of Shani or Saturn.



HOLI









EID-UL-FITR



PONGAL

Fig. 11.7 Many Indian festivals are linked with the movement of heavenly bodies and seasons.

Let us say it again

-  A star is a huge ball of gases. A star gives off its own heat and light.
-  Constellations are groups of stars which appear in definite patterns.
-  A planet is a heavenly body that moves around the sun in a fixed orbit. It reflects the sun's light which falls on it.
-  Including the earth there are eight planets that orbit around the sun. The sun, the eight planets and their natural satellites form the solar system.
-  Satellites are small heavenly bodies that revolve around planets. The moon is the earth's natural satellite.
-  Seasons are caused due to the earth's tilted axis and its revolution around the sun.

Let us answer

A. Tick (✓) the correct answer.

1. The sun is a
a. constellation. b. planet. c. star. d. satellite.
2. This planet was discovered after the invention of the telescope.
a. Mercury b. Venus c. Mars d. Neptune
3. This is the largest and fastest spinning planet.
a. Jupiter b. Venus c. Uranus d. Neptune
4. This planet is boiling hot by day and freezing cold at night.
a. Earth b. Mars c. Mercury d. Neptune
5. This planet has rings which are made up of ice, rocks and dust.
a. Saturn b. Venus c. Mars d. Uranus
6. This can be active, dormant or extinct.
a. tsunami b. sun c. volcano d. planet

B. Match the columns.

- | | |
|--|--|
| 1. our galaxy | a. Mercury |
| 2. planet nearest to the sun | b. innermost portion of the earth |
| 3. equator | c. natural satellite of the earth |
| 4. moon | d. solar year |
| 5. core | e. the Milky Way |
| 6. complete revolution of the earth around the sun | f. imaginary line dividing the earth in two equal halves |

C. Write short answers.

1. Name some Indian festivals that are linked to the seasons.
2. Name the imaginary line that runs through the centre of the earth.
3. Which movement of the earth is called rotation?



D. Answer these questions.

1. What is the difference between a star and a planet?
2. What do we mean by solar system?
3. What is a satellite? Name any two satellites launched by India.
4. How are seasons formed?

HOTS questions

E. Think and answer.

1. If the earth stops rotating on its axis, what kind of changes would you expect?
2. The season in the Northern Hemisphere can never be the same as the season in the Southern Hemisphere. Why?

Let us do



ENRICHMENT ACTIVITIES

F. Making a planet chart

Divide your class into nine teams.

Name the teams as Sun, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, and Moon.

Now collect all the information you can about the heavenly body after which your team has been named—its weather, soil and temperature.

Make charts.

Each team can then talk about what they have found.

Be ready to answer questions and to write or draw on the blackboard to explain facts.



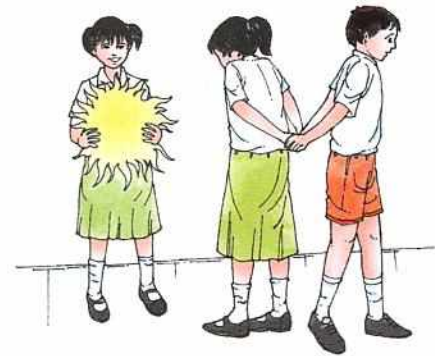
G. Name them.

1. A planet called the evening star _____
2. A planet that is covered with red dust, so it appears red in the sky _____
3. An instrument which helps us to see distant planets _____
4. Home to all living things _____
5. This is formed when hot molten material is thrown out of the earth _____

H. Write a letter to your cousin in Sydney, Australia, telling him how you are enjoying spring, the flowers, the weather and the 'Basant' festival. Ask him about the weather in Sydney.

I. Cycle of Day and Night.

- ❖ Cut out a 'sun' from a piece of cardboard. Paint it yellow. One child will stand with the 'sun'.
- ❖ Two children will stand back to back, hold hands and represent the 'earth'. One child will face the sun and the other will face away from it.
- ❖ The 'earth' children should rotate slowly, while on the spot.



The child who faces the sun, is in sunlight and is 'day'. The child who faces away from the sun is in dark and is 'night'.

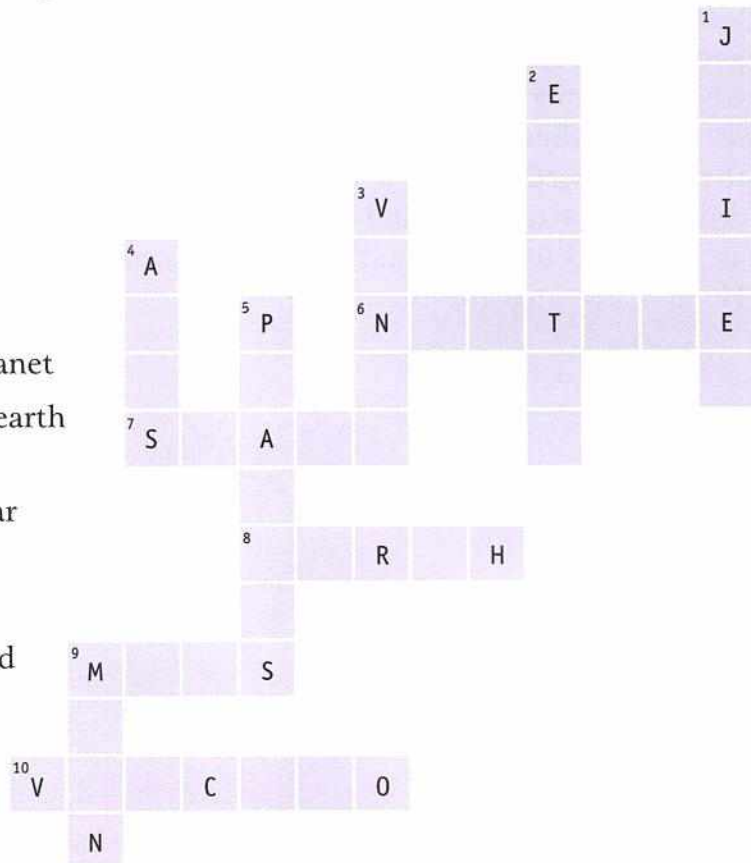
J. Solve this 'heavenly' puzzle.

A C R O S S

- 6 Freezing cold winds blow on this planet
- 7 They twinkle at night
- 8 Planet that supports life
- 9 Roman God of war
- 10 Erupts when hot boiling lava comes out of the earth

D O W N

- 1 Largest and fastest spinning planet
- 2 An imaginary line around the earth half way between the poles
- 3 Also known as the morning star
- 4 The tilted imaginary line on which the earth rotates
- 5 Heavenly bodies that go around the Sun
- 9 Natural satellite of the earth



A life skill



K. Celebrating Diwali with lights!

Diwali, an important festival in India, happens to fall on 'Amavasya'—a dark night when the moon is not visible. Celebrate it with diyas and lights. Say no to crackers. Make it a festival of lights.

Which is your favourite festival? Tick (✓) what would you do on that special day.

1. Share sweets with your friends.
2. Wear new clothes.
3. Fight with your friends.
4. Create a din by singing and dancing.
5. Burn crackers.



Let us meet



Galileo Galilei (1564–1642) was a great Italian scientist, astronomer and mathematician. He was also a gifted musician and painter. Once, while watching a lamp swing to and fro, he hit upon the idea of using a pendulum to measure time. He showed that all objects fall at the same speed. Galileo agreed with the theory that the sun is the centre of our universe and that the planets move around it. He built an improved telescope and used it to discover four moons of Jupiter. He also invented the thermometer.



GALILEO GALILEI

TEACHER'S NOTES: Make use of a model of the solar system. Conduct experiments to show (1) formation of day and night (2) seasons. Tell the children about the exploration to the moon.

Air, Water and Weather

AIMS

- To enable the student to
- understand how the sun affects the movement of air and changes the form of water.
 - learn about land breeze and sea breeze.
 - learn and appreciate how rain, dew, fog, frost, hail and snow are formed.
 - learn how water is purified.

AIDS

- bowls, thermometer, some sand
- beakers, funnel, tripod stand, filter paper, glass rod
- films or photographs
- depicting water scarcity, polluted air, global warming, etc.

Has it ever happened with you that you were out on a sunny day and suddenly it started raining? Who caused this change in the weather? Surely not the weatherman. It's the sun which causes changes in the weather. The heat of the sun affects the

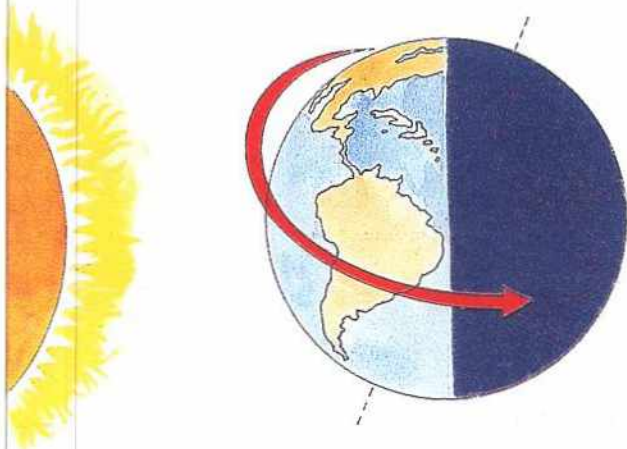
movement of air and changes the form of water, which bring about a change in the weather.

Weather is the condition of the atmosphere surrounding us at a particular time, in terms of temperature, atmospheric pressure, wind and moisture. The weather can be hot, cold, windy, dry or humid.

THE SUN CAUSES CHANGES IN WEATHER

We know that the part of the earth facing the sun has day and the other part has night. Thus, the rotation of the earth on its axis causes day and night.

We have also read that as the earth revolves around the sun, one half of it is close to the sun while the other half is away from it. The part of the earth that



12.1 The part of the earth which faces the sun has the day.

HUMID (hew-mid) when you feel sticky and sweat doesn't dry; it is humid because there is a lot of moisture in the air.

is closer to the sun has **warmer** and longer days. So, it is **summer** in this part of the world. The part of the earth away from the sun has cooler and shorter days. So, it is winter in this part of the world. Thus, revolution of the earth causes change in the season.

In countries like India, **winter**, **summer** and **monsoon** are the three main seasons. However, even during one season, the weather changes from day to day and sometimes from hour to hour.

The sun causes winds to blow

The movement of the wind is affected by the heat of the sun. The heat of the sun heats up the air. After heating, air becomes lighter and rises. The cool air, which is heavier, moves in to take its place.

The sun causes changes in the states of water

We know that clouds bring us rain. How are these clouds formed? The heat of the sun changes water into water vapour. This water vapour rises and forms clouds. When clouds become too heavy, they fall as rain. Water vapour falls as snow when the atmosphere is extremely cold.

AIR

We know air is all around us. We also know air contains water vapour, smoke, dust and germs. Around the earth is a thick layer of air. Moving air is called **wind**. Fast and strong winds can cause a **storm**. Let us now read about air currents.

Hot and cold air

To learn about air currents, we need to know how hot and cold air move.

ACTIVITY 1 Light a candle. Hold it in different positions as shown in Fig. 12.2. Watch its flame. Does the direction of the flame change as you tilt the candle?



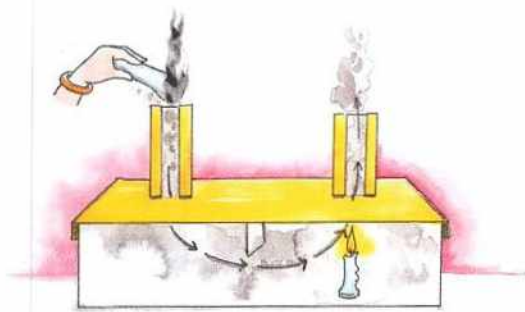
12.2 The candle flame always burns upwards.

ACTIVITY 2 Bring your hands close to the sides of the flame first and then above it. You will find that the air by the sides of the flame is not as hot as the air above. It proves that hot air rises up. Why does hot air rise? Let us see why.



12.3 Hot air always rises up.

ACTIVITY 3 Take a cardboard or wooden box with a glass front. Fit two wide glass tubes in holes at the top to form chimneys. Put a small lighted candle below



12.4 Formation of air currents

one of the chimneys. Hold a smouldering piece of paper at the top of the other chimney (Fig. 12.4). See what happens. The air above the candle gets heated and becomes lighter. It rises up. The smoke from the smouldering paper rushes into the box to take the place of the warm air. Thus, air currents are set up.

LAND BREEZE AND SEA BREEZE

Let us do an activity.

ACTIVITY 4 Take two bowls. Fill sand in one and water in the other.

- Keep both out in the sun. After two hours, use a thermometer to measure the temperature inside each bowl. Which is warmer—sand or water?
- Now keep the two bowls indoors. After an hour, check the temperature. Which is warmer? Complete this table with the words—warmer or cooler.

PLACE	TEMPERATURE OF SAND	TEMPERATURE OF WATER
outdoors		
indoors		

In a given time period, sand and water do not absorb or reflect the same amount

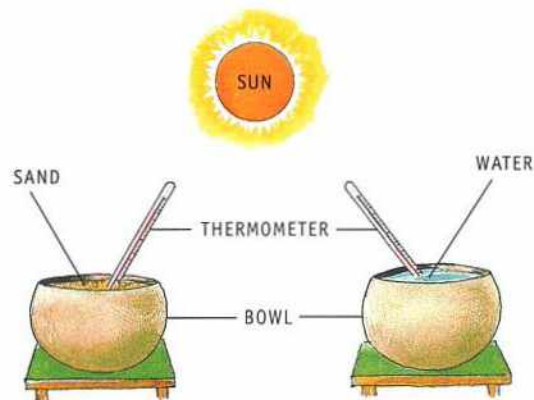


Fig. 12.5 Sand absorbs heat faster than water.

of heat. As you can see from the table, sand (or land) absorbs heat faster than water. It also cools down faster than water does. On the other hand, water absorbs and loses heat more slowly than land.

Land and water do not absorb or lose the same amount of heat in the same period of time. This difference gives rise to a **land breeze** at night and a **sea breeze** during the day. Let us see how.

Sea breeze

During the day, land gets heated quickly but the sea does not. When the air above the hot land gets heated, it rises as hot air is lighter. Cool air over the sea rushes in to take its place. Thus, a cool breeze blows towards the land during the day (Fig. 12.6).

Land breeze

At night, the land cools down faster than the sea. So the sea is warmer than the land. The hot air above the sea rises. The cooler air from the land blows towards the sea to take its place (Fig. 12.7).

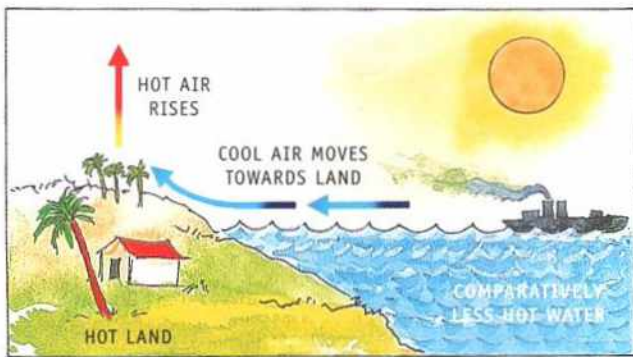


Fig. 12.6 Sea breeze during the day

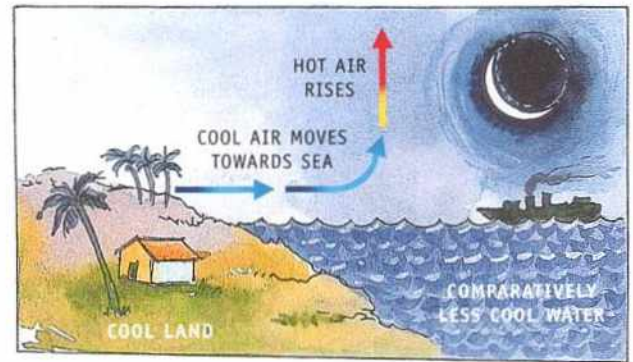


Fig. 12.7 Land breeze at night

WATER

About 71 per cent of the earth's surface is covered with water. Water is not found only in rivers, seas and oceans, but it is also found underground. It is even present in the air. Most of our body weight is made up of water. Water changes its form on heating and cooling. Let us read how.

Evaporation

The sun slowly heats the water on the surface of the earth to change it into water vapour. The process of change of water into water vapour due to heating is called **evaporation**. Evaporation of water takes place at a faster rate when

☁ there is a strong wind,

- ☁ the exposed surface of water is large,
- ☁ the temperature of the surroundings is high,
- ☁ the air is dry.

Water vapour goes up in the atmosphere and forms clouds. These clouds fall on the earth as rain. Water vapour also forms dew, frost, fog and snow.

Condensation

When water vapour cools down it changes into drops of water. This is called **condensation**.

Ice, water and water vapour are the three forms of water. However, in nature we see water in the form of fog, dew, frost, hail and snow as well.

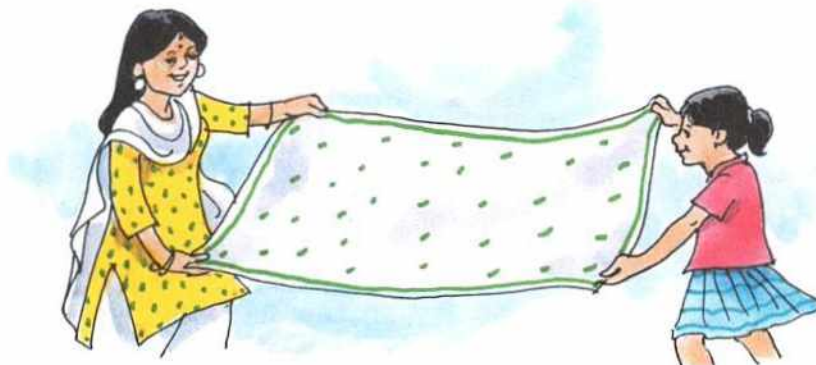


Fig. 12.8 Evaporation takes place at a faster rate when a strong wind is blowing.

EVAPORATION (ee-vap-o-ray-shun) water changing into water vapour on heating
CONDENSATION (kon-den-say-shun) water vapour changing into water on cooling

FOG: This occurs when thick clouds of tiny drops of water form just above land or water.

DEW: When the water vapour in the air condenses and appears as droplets on the ground and other surfaces, it is called dew. We often see dewdrops early in the morning (after a cold night) on leaves, flowers and standing vehicles.

FROST: When it is very cold, the dew or surface water freezes into tiny white crystals. This is called frost.

HAIL: When raindrops pass through a very cold region of the atmosphere, they freeze and become hail.

SNOW: When water vapour is suddenly cooled, it freezes into tiny white snowflakes.

Oral Questions

Choose the correct answer.

1. Air blowing towards the land from the sea is called sea breeze / land breeze / cyclone.
2. Air blowing towards the sea from the land is called sea breeze / land breeze / Tsunami.
3. Fog / Hail / Dew occurs when thick clouds of tiny drops of water form above land or water.

IMPURITIES IN WATER

The water in wells and rivers is impure due to the presence of **a. insoluble impurities** which can be seen, **b. soluble impurities** which cannot be seen, and **c. disease-causing germs**.

Purification of water

SEDIMENTATION AND DECANTATION: To separate insoluble impurities, let water stand for some time. Impurities that are heavier than water will settle at the bottom of the water leaving it clear. This is called **sedimentation** (Fig. 12.9a). Now slowly pour out this clear water into another vessel. This is called **decantation** (Fig. 12.9a).

FILTRATION: Another process of purification is **filtration** (Fig. 12.9b). At home, while pouring tea, you filter it through a strainer. You could also use a clean piece of cloth. In school laboratories, students use filter paper to remove insoluble impurities from liquids.

Similarly, water on the surface of the earth gets filtered when it passes through

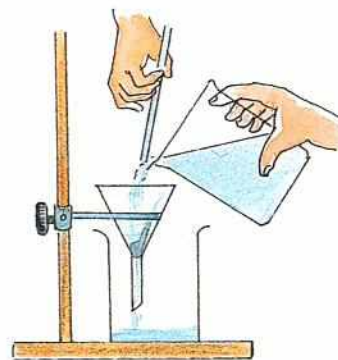
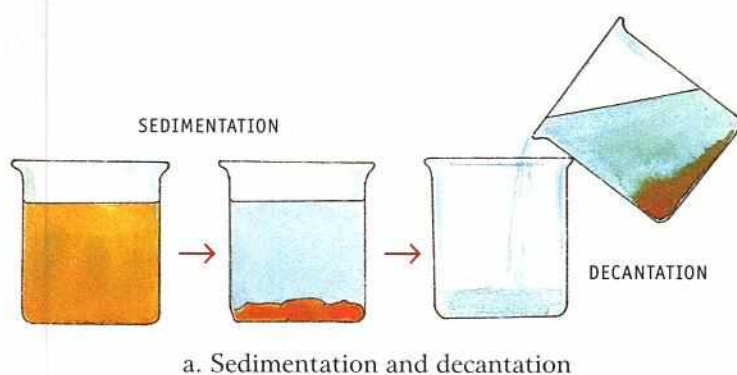


Fig. 12.9 Removing impurities from water

SEDIMENTATION (said-eemen-tay-shun)	settling down of heavy insoluble impurities in a liquid
DECANTATION (dee-can-tay-shun)	gently pouring liquid into another vessel after sedimentation
FILTRATION (fill-tray-shun)	purifying impure liquid by straining

IT'S A FACT!

Antarctica is the coldest, windiest and the driest place on earth. The lowest temperature ever recorded was -89.6°C in 1983 at Russia's Vostok Station.

layers of soil to become **underground water**. That is why this water is mostly safe and fit for drinking.

Though we can obtain clear water by these methods, water may still contain germs, and be unfit for drinking. So, we must purify the water to make it safe for drinking.

- ☔ Chemicals like chlorine are used to kill germs at the waterworks of a city. The process of adding chlorine is called **chlorination**.
- ☔ Bleaching powder also kills germs in water.
- ☔ If well water has to be used, potassium permanganate should be used to purify it.
- ☔ The safest method of purifying water is to boil it, as boiling destroys germs.
- ☔ We can also use a water filter for cleaning water.

It is important to store and handle water properly. It must be kept in covered

vessels which are cleaned regularly. The vessel used for taking out water from the container must also be clean.

UNDERGROUND WATER

Water changes its form and moves in a cycle in nature. Water that falls as rain and the water that we throw away goes down into the ground. It seeps through the topsoil, the subsoil and porous rocks. It finally settles below the porous rocks as it cannot pass through the non-porous rocks. So, there is a large storage of underground water. We draw out this underground water from tubewells and wells. Places that are dry have less underground water. The level of underground water in an area is called the **water table**.

Water is a precious natural resource. We should use it carefully. We should not waste water.

THINK GREEN!

Water in which vegetables and fruits have been washed can be used to water plants. If you have some water left in your water bottle, do not throw it away. Use it to water plants.

Let us say it again

- ☔ The sun causes changes in weather. It affects the temperature and length of the day.
- ☔ Air currents are set up when hot air rises and cooler air takes its place.
- ☔ Land gets heated faster than water. It cools down faster too.
- ☔ On heating, liquid water changes into water vapour. This is called evaporation.
- ☔ On cooling, water vapour changes into liquid water. This is called condensation.

- ☁ In nature, the effect of evaporation and condensation of water is seen as rain, dew, frost and snow.
- ☁ Water has soluble impurities, insoluble impurities and disease-causing germs.
- ☁ Insoluble impurities are removed by sedimentation and decantation, and filtration.

Let us answer



A. Tick (✓) the correct answer.

1. Changes in the weather are caused primarily due to
 - a. sun.
 - b. clouds.
 - c. rain.
 - d. wind.
2. Clothes take long time to dry
 - a. when the weather is windy.
 - b. when the air is wet.
 - c. when the temperature is high.
 - d. when the air is dry.
3. The process of changing of liquid water into water vapour is known as
 - a. evaporation.
 - b. condensation.
 - c. chlorination.
 - d. decantation.
4. Which of the following is not a way of purifying water?
 - a. sedimentation
 - b. chlorination
 - c. filtration
 - d. cooling
5. Frost is formed when it is
 - a. very hot.
 - b. windy.
 - c. raining.
 - d. very cold.

B. Change the underlined words to make correct statements. Rewrite the correct statements in your notebook.

1. The season changes from day to day.
2. The revolution of the earth on its axis causes day and night.
3. In winter the days are longer.
4. A flame burns downwards.
5. Hot air is heavier than cold air.
6. In coastal areas hot winds blow towards the land during the day.
7. Fog is caused by tiny white flakes falling from the sky.

C. Write short answers.

1. What do you mean by weather?
2. How is condensation different from evaporation?
3. What are the two types of impurities in water?
4. What is chlorination?
5. Define water table of an area.



D. Answer these questions.

1. What is a land breeze? How does it occur?
2. How is hail different from snow?
3. What are the different ways of purifying water?

HOTS questions

E. Think and answer.

1. Even on a very hot day, people in coastal areas do not feel very hot. Why?
2. Early on winter mornings we see drops of water on parked cars and plants. Why?

Let us do

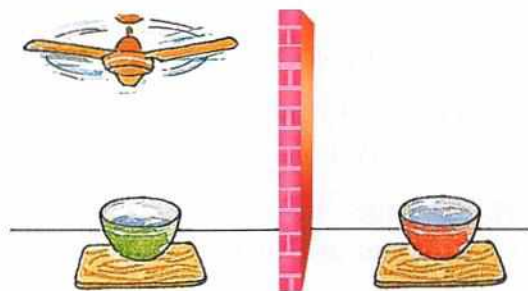


ENRICHMENT ACTIVITIES

F. Does water evaporate faster in windy conditions? Let us find out.

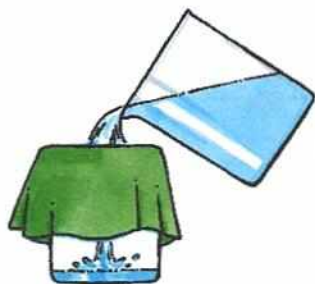
Take two identical glass bowls and some water.

- ❖ Fill the glass bowls with equal quantities of water.
- ❖ Keep the water level in the bowls equal and mark these levels.
- ❖ Now place one of the bowls directly under a fan for half an hour and the other away from the fan.
- ❖ Mark the water levels in the bowls after two hours.



The water level of the bowl under the fan is lower than that of the other bowl. This means that water evaporates faster in windy conditions.

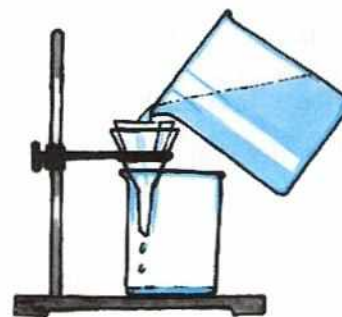
G. Take some muddy water in a beaker. Filter it in the three different ways as shown below. Which do you think is the most effective method? Why? Discuss with your partner.



1

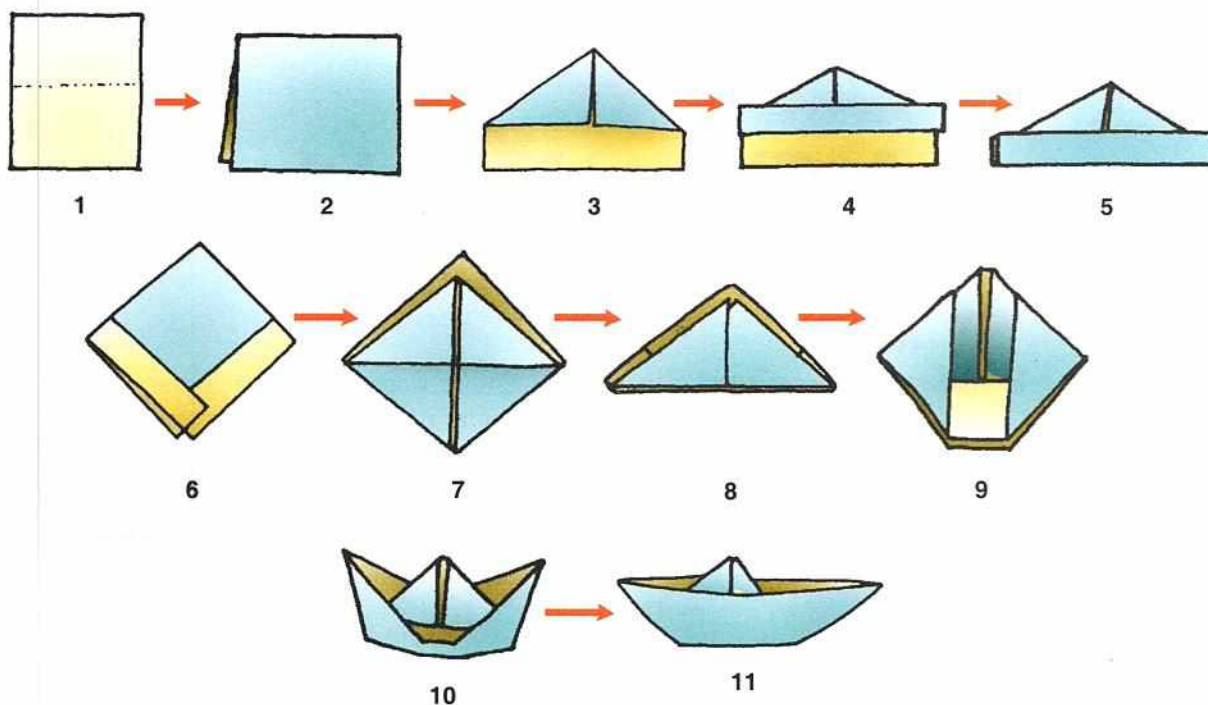


2



3

H. Make a 'paper boat' as shown below. Sail your boat in a rain puddle.



I. Keep your own rainfall records. Take a clean, empty jam jar. Keep it out in the open. This is your rain gauge. Use a ruler to measure the amount of rainwater collected in it, each time it rains. Remember to empty the jar after that. Find the total of a month's measurement.

J. Visit the chemistry laboratory in your school.

TO VISIT

Visit the chemistry laboratory in your school and observe the process of filtration and distillation.

Let us meet

Lord Kelvin (1824–1907) was a brilliant scientist and engineer. He is famous for his work on electricity, magnetism and heat. He invented a scale of temperature based on the fact that it is impossible to get below a temperature of about $-273\text{ }^{\circ}\text{C}$. Scientists now use the Kelvin scale, in which this temperature is zero and the freezing point of water is 273.15 kelvin. Relation between Kelvin scale and Centigrade scale is $K = C + 273.15$.



LORD KELVIN

TEACHER'S NOTES: Ask the children to relate their experiences of weather change. Conduct experiments to show air currents, sedimentation, decantation and filtration. Ask them to repeat these at home. Discuss different ways of purification of water. Children can find out the names of new brands of water purifiers.

A Clean World

AIMS

- To enable the student to
- understand the concept of environment.
 - know about land, water, and air pollution.
 - know about the concept of reduce, reuse and recycle.

AIDS

- CDs or video films on pollution or degradation of the environment
- a picture or a model of a green earth
- charts or pictures on how to reduce air, water and land pollution

The environment includes all living and non-living things surrounding us. This includes land, water, air, plants and animals. Human beings are also a part of it.

The environment keeps on changing due to rise in population. As the population is increasing day by day, more and more houses are being made. Where does the land for making these houses come from? More and more trees are



Fig. 13.1 Land for these buildings is made available by cutting down a large number of trees.

being cut down to make this land available. New factories are being set up to meet the various demands of human beings. The number of vehicles running on the road too is increasing continuously. The amount of smoke produced is also increasing and the purity of air, water and land is getting affected. In other words, air, water and land are getting polluted.

POLLUTION

Pollution means the presence of harmful substances in air, water and land that can cause harm or discomfort to human beings and other living organisms. The harmful substances which pollute air, water and land are called **pollutants**.

Air pollution

As the number of vehicles and industrial units increase, air pollution increases. This is because of the burning of fuels



Fig. 13.2 Air pollution caused by factory smoke



Fig. 13.4 Land pollution caused by domestic waste

like coal, petrol or diesel in vehicles and factories. The smoke from these vehicles and factories is released into the air making it dirty and unfit for breathing. Gases like carbon dioxide and methane from industrial units also mix with the air and pollute it.

Water pollution

Those who live near rivers and lakes throw all kinds of waste into the water. Many people wash clothes and utensils in river water and pollute it. Drains from towns and cities carry dirty water mixed with soap, detergent and chemicals and release all



Fig. 13.3 Water pollution caused by soapy waste and chemicals

these into rivers, lakes or seas. Some amount of fertilizers and chemicals from agricultural fields also pollute the water. Many harmful microorganisms grow in polluted water and cause diseases such as diarrhoea and typhoid. When fertilizers and chemicals reach the water they harm aquatic life and kill fishes and other water animals.

Land pollution

Mixing of harmful substances with soil is called land pollution. Land pollution is caused by domestic, industrial and agricultural waste. Agricultural waste includes not only parts of plants but also



Fig. 13.5 Land pollution caused by factory waste

Oral Questions

Choose the correct answer.

1. Pollution means the presence of harmful / harmless / useful substances in air, water and land.
2. The petrol / diesel / smoke from vehicles and factories is released into the air making it dirty.
3. Harmful microorganisms of polluted water can cause disease like typhoid / headache / flu.

chemicals used to destroy weeds and pests. Animal waste too pollutes land.

Biodegradable and non-biodegradable waste

Some wastes like fruit and vegetable peels, things made out of paper and wood, generally decompose or rot. Finally, they get mixed with the soil. Such waste is called **biodegradable waste**.

On the other hand waste of plastic, metal, glass and rubber cannot be decomposed. Such waste is called **non-biodegradable waste**. It never rots but remains in the soil for a very long time and pollutes it.

PREVENTING POLLUTION

Our forefathers passed on a clean earth to us. If pollution continues at the present rate we may not be able to leave a healthy earth for future generations. So, we have to make efforts to reduce pollution and retain the beauty of this planet.

Disposal of waste is a big problem. Hence, waste management is of utmost importance. This is the job given to *Panchayats* in villages, municipalities in

towns and corporations in cities. However, each one of us has to do our bit.

- ♻️ Wet waste and dry waste must be disposed off separately. Wet waste must be taken to decomposing units and dry waste for recycling or burning.
- ♻️ The authorities must dump the decomposable waste in pits where it can be changed into manure or compost.
- ♻️ We must avoid the use of plastic bags because plastic bags block drains and stop the flow of dirty water. Wherever there is standing water mosquitoes lay eggs. These spread diseases.
- ♻️ Before letting dirty water into seas, rivers or lakes, it must be treated with chemicals to make it less harmful.
- ♻️ To check air pollution, we must get our vehicles fitted with CNG or LPG kits. CNG and LPG are non-polluting fuels. Regular pollution checks of vehicles help prevent air pollution.
- ♻️ Tall chimneys with filters must be fitted in factories to release smoke and gases very high away from the populated places.

REUSE OR RECYCLE

These days plastic is used to make a lot of useful, colourful and lightweight things

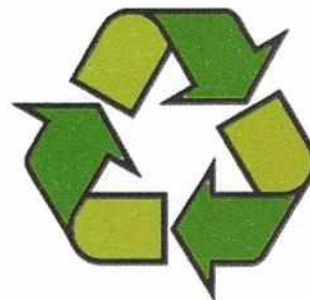


Fig. 13.6 Symbol of recycle

for daily use. However, plastic waste is not easy to dispose off. Our landfills or dumping places are filled with plastic objects, especially plastic bags. We must say 'No' to plastic bags and carry paper or jute bags for shopping. There are some plastics that can be recycled and used for making things like flower pots, tubs and park furniture.

THINK GREEN!

- ♻️ Save water! Turn off the tap when not in use.
- ♻️ Do not burn fallen leaves. Let them rot naturally as they make the soil fertile.
- ♻️ Do not waste paper. Plant more trees.
- ♻️ Whenever possible recycle things.
- ♻️ Save energy, switch off extra lights and fans.

Let us say it again

- ♻️ Our environment includes everything that surrounds us. This includes land, air, water and living things.
- ♻️ Pollution means the presence of harmful substances in air, water and land. Land pollution is caused by disposal of domestic, industrial and agricultural waste into land.
- ♻️ Water pollution is caused by disposal of waste from living things, industries and agricultural fields into water.
- ♻️ Release of smoke and poisonous gases from vehicles and industrial units into air cause air pollution. We must try to prevent pollution to keep our planet beautiful and green.
- ♻️ Disposal of waste has to be managed well to prevent pollution.
- ♻️ As citizens we must help Panchayats, municipalities and corporations to reduce pollution. Say 'NO' to plastic.

Let us answer

A. Tick (✓) the correct answer.

1. Pollution causes
a. recreation. b. comfort. c. pleasure. d. diseases.
2. This fuel causes pollution.
a. coal b. LPG c. biogas d. CNG
3. Waste consisting of this material cannot be decomposed.
a. plastic b. vegetables c. paper d. fruits
4. For proper waste management we should cooperate with
a. cows. b. neighbours. c. municipalities. d. teachers.

5. We must stop using these bags to prevent environmental pollution.
- a. paper b. plastic c. cloth d. eco-friendly

B. Fill in the blanks.

1. _____, _____ and _____ are getting polluted because of increasing population.
2. Coal, petrol and diesel release _____ on burning.
3. _____ waste and _____ waste should be disposed off separately.
4. _____ bags stop the flow of water in the drains.
5. Aquatic animals and plants are adversely affected by _____ and _____ that reach the water.

C. Write short answers.

1. How is land made available for making more houses and factories?
2. What does agricultural waste include?
3. Name two diseases that are caused due to polluted water.
4. Name two things that can be recycled.

D. Answer these questions.

1. How do people living near rivers pollute water?
2. Write two ill-effects of water pollution.
3. What is biodegradable waste?
4. Write two ways by which air pollution can be controlled.
5. What do you understand by landfills?



HOTS questions

E. Think and answer.

1. The Government of India has banned the use of plastic bags. Why?
2. Vehicles should be checked regularly for the amount of pollution they cause. Why?
3. We should not burn fallen leaves. Why? What can we do with them?

Let us do



ENRICHMENT ACTIVITIES

- F. Find pictures in old magazines showing pollution. Cut them out and paste them on chart paper. Bring the chart to school. Discuss the pictures with your friends and your teacher.**

G. Recycling of paper



A



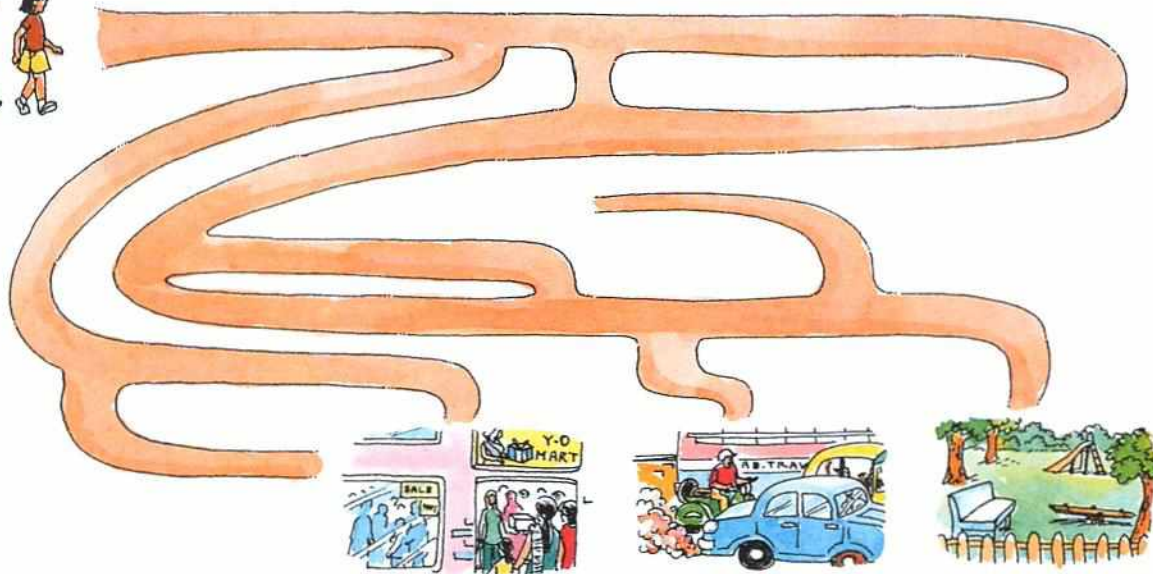
B



C

Tear a sheet from an old newspaper into small pieces. Now request an adult to soak these pieces in boiling water for 30 minutes. Keep stirring till the pieces become soft and soggy. At this stage you can add some colour or pieces of dried flowers and leaves. Add some glue to the mixture. Drain out the excess water. Take out the soft paper pulp and put it on dry paper. Make balls out of it. Use a rolling pin to make square or rectangular shaped paper. Dry the paper or ask an adult to iron it. Use this recycled paper to make cards.

H. Help Adit and Riya to reach a place where the air is fresh and clean. Which destination would you choose to avoid polluted air?



I. Make a model of a factory with a chimney. Light a candle or an *agarbatti* under the chimney very carefully. Watch the smoke moving.

J. Visit the city waste disposal site.

TO VISIT

Visit the city waste disposal site in your city and observe how biodegradable and non-biodegradable wastes are separated there. Find out whether they take steps to separate hazardous waste like glass pieces or needles. Write your observation in your notebook.

A life skill



K. Recycling your old clothes.

Some people exchange old clothes for utensils. Some throw them away. Let's do something to bring happiness to others. Send your old clothes to children who need them and will be happy to get them. Some clothes can be used to make blankets, carpets or as stuffing for mattresses, dolls and other toys.

Visit rsgr.in/lsc-4 and click on LINK 8 to know about the NGO, Goonj, which collects and distributes clothes.



A subject link



(MATHEMATICS)

- L. After reading about the hazards of air pollution, Mr Baruah decided to fit a CNG kit in his car. His car runs on petrol which gives a mileage of 13 km per litre of petrol. He goes to office in his car which is 10 km away from his residence. But on coming back from office he takes a different route as he has to pick up his daughter Rhea from her coaching class. This route is 4 km longer than the previous one. Petrol costs Rs 52 in Delhi where Mr Baruah stays. Calculate the daily cost of running the car with petrol. The running cost of his car with a CNG kit is Rs 3.50 per km. How much will Mr Baruah now save per km with CNG?

TEACHER'S NOTES: Discuss the causes of pollution on land, air and water. Make children understand how different kinds of pollution affect human beings. Stress on the importance of preventing pollution.

Check Your Understanding

Enrichment Activities

A. Make a solar water purifier

If you had no fresh water to drink, you could distill (or purify) water by taking advantage of evaporation.

You will need: water, salt, a large bowl, a short glass, plastic wrap, masking tape and a small weight.

- ❖ Add salt to two cups of water and stir until it dissolves. Pour it into a large bowl.
- ❖ Place a short glass in the middle of the bowl. (This glass should be shorter than the rim of the bowl, but taller than the level of the saltwater.)
- ❖ Now, cover the bowl with plastic wrap, taping the edges, if necessary, to get a tight seal.
- ❖ Place a small weight on top of the plastic directly over the glass in the bowl. This helps you collect the distilled water in the glass.
- ❖ Put the bowl outside in the sun. Leave it for several hours or for the whole day.
- ❖ When you check it again, there will be water in the cup. Taste it to find out if it is salty or fresh!

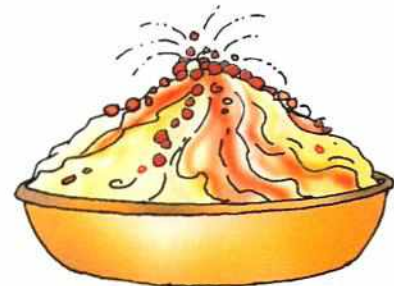


Guess what had happened. (**Hint:** The sun warmed the water in the bowl until it evaporated.)

B. Home-made volcano.

You will need: red food colour, some vinegar, a plastic bottle, baking soda, a tray, gravel and sand.

- ❖ Add red food colour to some vinegar in a small bottle.
- ❖ Half fill a plastic bottle with baking soda. Place it upright in the middle of a large dish or a tray.
- ❖ Pile gravel and sand around this bottle leaving the hole uncovered.
- ❖ Smoothen the sand in the shape of a volcano. Then quickly pour all the red vinegar into the bottle.
- ❖ Watch out for eruption.



Guess what had happened. (**Hint:** Baking soda [Sodium bicarbonate] reacts quickly with vinegar to form bubbles of carbon dioxide gas, causing a sort of volcanic eruption.)

C. Make your own paper bag.

Use old newspaper or old calendar to fold and make a carry bag. Make a smart handle. Do not accept plastic bags from vendors. Carry your own cloth or paper bag when you go out for shopping.

Yoga and You

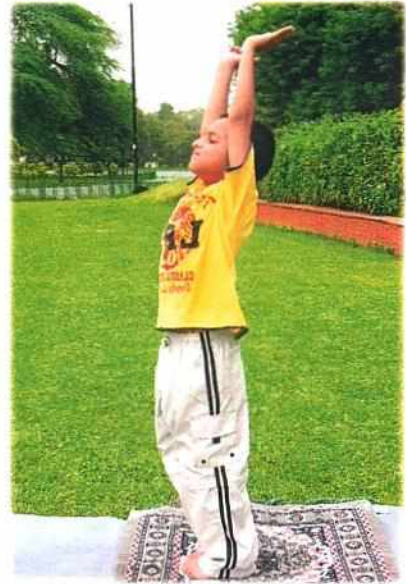
Yoga helps us relax.

It teaches us self-control and self-discipline.

TAKE A 'BREATH OF JOY'

- Stand up as tall as you can.
- Open your arms wide.
- Move your head backwards and inhale.
- Breathe out slowly.
- Now, stretch your arms upward as much as possible.
- Bring your arms around your chest and hug yourself.
- Stretch out your arms again and breathe in.

Do this 5 to 6 times when you get up in the morning.



RELAX AND CONTROL YOUR BREATHING

Practise breathing only through your nostrils.

- Close your right nostril with the thumb of your right hand. Inhale through the left nostril (count 4).
- Hold the breath for a little longer (as you get practice).
- Now close the left nostril with the little finger of your right hand. Exhale fully through the right nostril (count 8).
- Keeping the left nostril closed inhale through the right nostril.
- Hold your breath. Open the left nostril and exhale.

Do this 8 to 10 times.



Technology and You

Technology has made our life comfortable. Our roads are full of scooters, autorickshaws, cars, buses and trucks. Most houses have refrigerators. Some have airconditioners. Factories everywhere produce useful things for us.

However, things were different when your grandparents were your age.

THEN — Many people used cycles to go to work or walked long distances. Of course they got more exercise.

NOW — We want to save time. We travel by cars and buses. There are traffic jams. The fuels used in these vehicles give out chemicals and gases. This pollutes the air. Polluted air harms our health and can cause dangerous diseases.



THEN — People slept out in verandahs and in courtyards. They enjoyed the fresh air of palm-leaves or bamboo fans.

NOW — Mostly people sleep indoors as it is safer. Many use air-coolers. Since the room is closed the moisture in the air increases. This causes health problems. The use of airconditioners and refrigerators has become very common. The gas used for cooling in such appliances, when exposed, pollutes the atmosphere. It causes harmful rays to reach us. This too is dangerous.



THEN — People were very happy with occupations like farming, fishing, weaving and teaching.

NOW — We see small and big factories coming up everywhere. We do not like to go to an industrial area as we see smoke coming out of chimneys or chemical waste coming out through a pipe into a water body. This causes air and water pollution.

WHAT CAN WE DO?

- ◆ We should walk or cycle whenever we can.
- ◆ We should keep our vehicles clean and in good running condition.
- ◆ We should not continuously be in airconditioned rooms or even closed rooms. We should spend some time in the open.
- ◆ We should plant as many trees as possible. Can you say why?
- ◆ Factories should be located away from cities, towns and water bodies.

LET US USE TECHNOLOGY, NOT MISUSE IT.